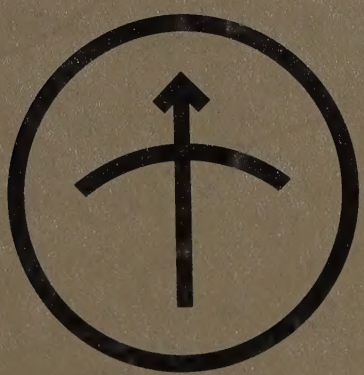
PLEASE RETURN TO LIBRARIAN
ORD. 6-7744 M.S. 27-14
manual #
Please return to Librarian 6-7744 MS 26-73

MODEL 58 AS
VHF RADIO NOISE AND FIELD
STRENGTH METER

TURN TO LIBRARIAN
27-14

Operating
INSTRUCTIONS



MEASUREMENTS

A McGRAW-EDISON DIVISION

BOONTON NEW JERSEY

MODEL 58 AS
VHF RADIO NOISE AND FIELD
STRENGTH METER

PLEASE RETURN TO LIBRARY
ORG. 6-7744 M.S. 27-14
manual #2

Operating INSTRUCTIONS

NO PART OF THIS MANUAL MAY BE
REPRODUCED IN WHOLE OR IN PART
EXCEPT BY PERMISSION OF
MEASUREMENTS.

COPYRIGHT 1956 BY MEASUREMENTS
Printed IN U.S.A.

MEASUREMENTS
A McGRAW-EDISON DIVISION
BOONTON NEW JERSEY

Digitized by the Internet Archive
in 2025

https://archive.org/details/manualsplus_06223

TABLE OF CONTENTS

		Paragraph	Page
CHAPTER 1.	INTRODUCTION		1
Section I.	GENERAL		1
	Scope of Manual.....	1	1
Section II.	DESCRIPTION AND DATA		1
	General.....	2	1
	Technical Characteristics.....	3	2
	Components Supplied.....	4A	5
	Export Packaging.....	4B	5
CHAPTER 2.	OPERATING INSTRUCTIONS		6
Section I.	SERVICE UPON RECEIPT OF EQUIPMENT		6
	Unpacking.....	5	6
	Preliminary Precautions.....	6	6
Section II.	CONTROLS AND INSTRUMENTS		6
	Vernier Tuning Knob & Frequency Range Push Buttons.....	7	6
	Four Decade Push Buttons.....	8	6
	CW Zero Push Button.....	9	6
	Cal Knob And Cal Push Button.....	10	6
	Adj Knob And Adj Push Button.....	11	7
	Off Push Button.....	12	7
	Zero Knob And Zero Switch.....	13	7
	Log-Lin Switch.....	14	7
	Megacycles Dial.....	15	7
	I-F Attenuator Knob.....	16	7
	Ext Meter Jack.....	17	7
	Peak Knob.....	18	7
	Calibration Dial.....	19	7
	Microvolts Meter.....	20	7
	Antenna Jack.....	21	7
	Peak, Quasi-Peak, Average.....	22	8
	Phone Jack.....	23	8
	Megacycle Tuning Knob.....	24	8
Section III.	OPERATION		8
	Installation And Adjustment.....	25	8
	Connections For Operation.....	26	8
	Preliminary Operational Checks.....	27	8
	Calibration Procedure.....	28A	10
	Alternate.....	28B	11
	Operation And Use.....	29	11

CONTENTS - Continued

		Paragraph	Page
CHAPTER 3.	MAINTENANCE INSTRUCTIONS		14
Section I.	MAINTENANCE		14
	General	30	14
CHAPTER 4.	EQUIPMENT USED WITH MODEL 58-AS		15
Section I.	GENERAL		15
	Recommended Accessories	31	15
	Associated Equipment	32	15
CHAPTER 5.	APPLICATION OF MODEL 58-AS AND INTERPRETATION OF RESULTS		17
Section I.	GENERAL		17
	Accuracy	33	17
	Radio Noise Interference And Impulse Measurements	34	17
	Use Of Antennas	35	18
	Radio Field Strength Measurements	36	18
	Power Line Noise Measurements	37	19
	Voltage Ratio Measurements	38	21
	Model 58-AS As R-F Voltmeter	39	21
Section II.	INTERPRETATION OF RESULTS		22
	General	40	22
	Radio Field Strength Measurements	41	22
	Noise Measurements	42	23
CHAPTER 6.	TECHNICAL SERVICE-MAINTENANCE INSTRUCTIONS		24
Section I.	GENERAL		24
	Scope	43	24
Section II.	CONDENSED THEORY OF OPERATION		24
	General	44	24
	Physical Description	45	24
	Input Attenuator	46	24
	R-F Amplifier, Converter And Oscillator	47	24
	I-F Amplifier	48	26

CONTENTS - Continued

		Paragraph	Page
Section II. - Cont.			
	Metering And Monitoring Circuits..	49	26
	Power Supply.....	50	27
	High-Impedance Probe.....	51	27
	Calibration.....	52	27
Section III.	TROUBLE LOCATION		28
	Repairs.....	53	28
	Analysis Of Trouble.....	54	28
Section IV.	REPAIR PROCEDURES		33
	Removing Model 58-AS From Its Case	55	33
	Replacing Model 58-AS In Its Case..	56	33
Section V.	CIRCUIT DATA		33
	Voltage And Resistance Measurements	57	33
	Action Of Push Buttons	58	33
APPENDIX I.	STORAGE AND SHIPMENT		38
II.	TABLE OF REPLACEABLE PARTS		39-68
FIGURES			
Figure 1.	Front Panel Details of Model 58-AS		v
Figure 2.	Typical Average Selectivity Characteristic Of Model 58-AS		3
Figure 3.	Recommended Calibration Set-Up For Model 58-AS		12
Figure 4.	Effective Height Of Antennas		20
Figure 5.	Block Diagram Of Model 58-AS		25
	Complete Schematic Diagram		Rear of manual
TABLES			
Table I.	Table of Components		5
II.	Export Packaging Data		5
III.	Antenna And Input System Chart		9
IV.	Accessory Kit List		16
V.	Trouble Shooting Chart		29-32
VI.	Voltage And Resistance Chart		35-37

Additional information with regard to the applications and maintenance of this equipment will be available from time to time. Users of the Model 58-AS are urged to discuss their problems with us and to suggest such modifications as might make the instrument more adaptable to their special requirements.

Maintenance difficulties should be reported to Measurements Corporation before proceeding with actual repairs, since, through our familiarity with the instrument, we are able to suggest the appropriate repair procedure.

Engineering Department

MEASUREMENTS CORPORATION

Boonton, New Jersey

U. S. A.

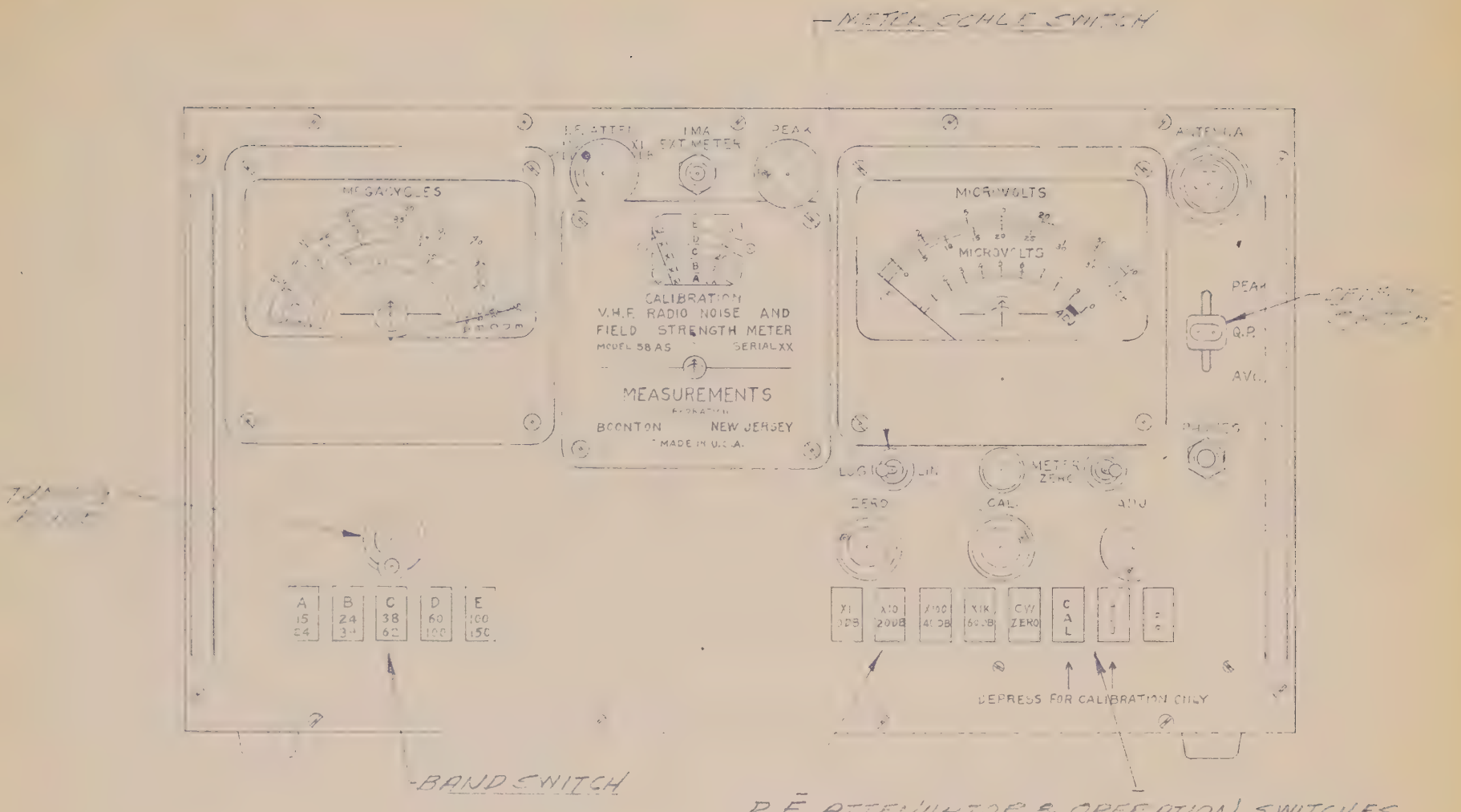


Figure 1. - Front Panel Details Of Model 58-AS.

CHAPTER 1

INTRODUCTION

SECTION I

GENERAL

1. SCOPE OF MANUAL

a. This manual describes and defines the characteristics, performance, and basic operation of Measurements Model 58-AS VHF Radio Noise and Field Strength Meter. Sufficient data are included to facilitate the intelligent use and handling of the instrument.

b. This book contains copyrighted material. Reproduction in whole or in part is prohibited except by permission of Measurements Corporation.

SECTION II

DESCRIPTION AND DATA

2. GENERAL

a. The Model 58-AS, shown in Figure 1, enables the operator to explore and evaluate minute voltages relating to electromagnetic phenomena and their accompanying fields of disturbance in the frequency range from 15 to 150 megacycles.

b. It is a completely portable instrument that incorporates laboratory design features which make it a multipurpose device, suitable either for the measurements of steady carrier voltages or fields, as in field-strength survey work, or, for the evaluation of the nuisance value of noise voltages or fields, as in testing radiation from the ignition systems of motor-driven vehicles. As a sensitive voltmeter, the Model 58-AS is useful for measuring line loss, front-to-back ratios of directional antennas, signal-to-noise ratios existing on various antennas, effectiveness of noise filter, etc.

c. The instrument is essentially a laboratory-type, five-band superheterodyne receiver with its gain standardized at a fixed value. Its characteristics are listed in Paragraph 3. Indications are readable directly on a calibrated microvolt meter, with provisions for headphone monitoring and recorder connections. To insure accuracy, the instrument possesses a self-contained calibration circuit, a preselector stage having a high image rejection, a balanced-to-ground attenuator network, and provisions for obtaining average, quasi-peak or peak measurements.

3. TECHNICAL CHARACTERISTICS

a. Frequency Range: 15 to 150 megacycles in five bands as follows:

BAND	
A	15 to 24 Mc.
B	24 to 39 Mc.
C	38 to 62 Mc.
D	60 to 100 Mc.
E	100 to 150 Mc.

b. Frequency Accuracy: Dials directly calibrated in megacycles to an accuracy of ±2%.

c. Input Voltage Range:

Logarithmic - 100 microvolts r.m.s. full-scale to 1 volt r.m.s. full-scale.

Linear - 10 microvolts r.m.s. full-scale to 0.1 volt r.m.s. full-scale.

Maximum Sensitivity - Will give a readable deflection on CW signals of 1 microvolt r.m.s.

d. Input Impedance:

72 ohms balanced to ground.

e. Attenuators:

R-F Input Attenuator - X1, X10, X100 and X1000. (Also labelled 0 DB, 20 DB, 40 DB and 60 DB).

I-F Attenuator - X1, and X10. (Also labelled 0 DB and 20 DB).

f. Metering System:

Linear - 0 to 10 microvolts r.m.s. full-scale.

Logarithmic - From 0 to 10 microvolts r.m.s. mid-scale and 100 microvolts r.m.s. full-scale.

Decibel - To facilitate readings in decibels, the log scale is also calibrated in DB above 1 microvolt r.m.s. It is approximately linear with 20 DB at mid-scale and 40 DB at full-scale.

g. I-F Selectivity:

1. For CW signals, bandwidth is 140 kilocycles at 6 db points. (See Fig. 2). Tolerance ± 10%.

2. Impulse bandwidth is 150 Kc. This corresponds to the bandwidth at the 0.45 or 7 db response point on the selectivity curve. Tolerance ± 10%.

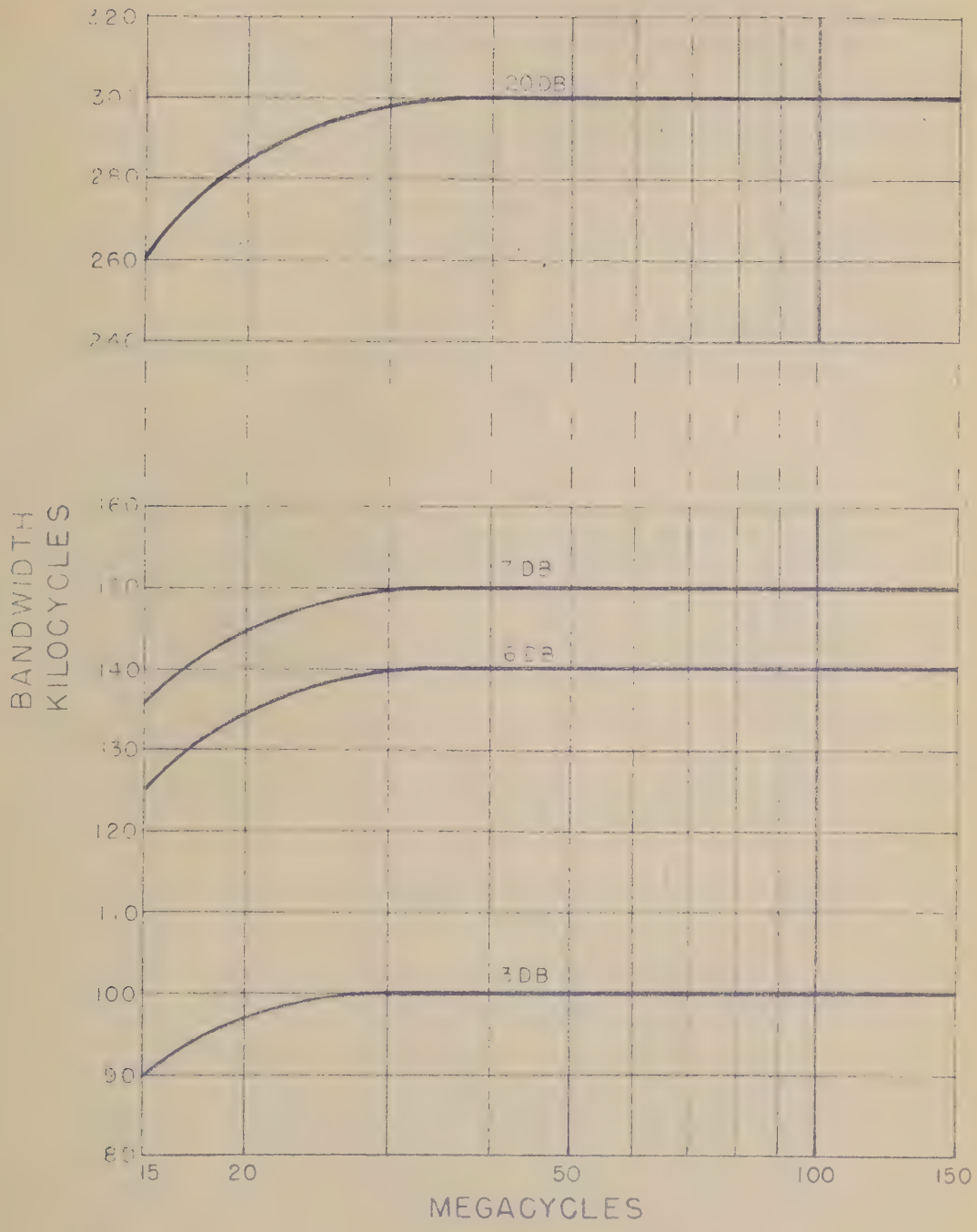


Figure 2. - Typical Average Selectivity Characteristic of Model 58-AS.

h. Detector Response:

Quasi-Peak: Charge time - 1 plus or minus 0.5 milliseconds.

Discharge time - 600 plus or minus 120 milliseconds.

Peak Aural "Slide-Back" and Average: Charge and Discharge time equal to $\frac{1}{5 \Delta F}$ where ΔF is the 6 db bandwidth.

i. Image Rejection: At least 60 db below 70 Mc., 50 db above 70 Mc.

j. I-F Rejection: At least 50 db.

k. Intermediate Frequency: 12 megacycles.

l. Output Circuit:

PHONES output Jack also provides oscilloscope response up to full r-f bandwidth. EXT. METER Jack for 1 milliampere recording meter or remote meter.

m. Gain Standardization: Internal "Shot Noise" diode provides calibration reference standard. Special dial mechanically coupled to tuning dial eliminates need for charts.

n. Circuit: Five-band superheterodyne, with tuned r-f amplifier preceding mixer.

o. Power Supply: 117 volts, 50 to 60 cycles, 55 watts.

NOTE:

The Model 58-AS is a tuned vacuum-tube voltmeter having an input resistance of 72 ohms balanced to ground. The AVERAGE, QUASI-PEAK and PEAK readings of the Model 58-AS are calibrated in terms of the root-mean-square value of a continuous sine-wave voltage applied across the 72-ohm input. Although the PEAK aural slide-back detector responds to the peak value of the envelope of the signal applied to the detector, it is calibrated in terms of the r.m.s. value of a sine wave having the same peak amplitude.

4A. COMPONENTS SUPPLIED

a. See Table I. Table of Components.

TABLE I. TABLE OF COMPONENTS

Quan.	Description	Dimensions			Unit Weight	Volume Cu. Ft.
		Height	Width	Depth		
1	Model 58-AS VHF Radio & Field Strength Meter.	9-1/4"	15-11/16"	11-13/16"	Approx. 30 lbs.	1.1
1	Instruction Book					
1	Tube, RETMA #955, installed.					
2	Tube, RETMA #6AK5, installed.					
1	Tube, Sylvania 5845, installed.					
3	Tube, RETMA #6CF6, installed.					
1	Tube, RETMA #6AL5, installed.					
1	Tube, RETMA #12AU7, installed.					
1	Tube, RETMA 0A2/VR-150, installed.					
1	Tube, RETMA 6AK6, installed.					
1	Tube, RETMA 6X4					
1	9-inch loop.					
1	15-foot antenna cable.					
1	Phone Plug Filter H-5929.					

4B. EXPORT PACKAGING

a. Packed for export, the Model 58-AS is crated in a wooden box.

TABLE II. EXPORT PACKAGING DATA.

Number of Packages	Dimensions			Weight	Volume Cu. Ft.
	Height	Width	Depth		
1	22"	18"	17"	70#	3.9

CHAPTER 2

OPERATING INSTRUCTIONS

SECTION I

SERVICE UPON RECEIPT OF EQUIPMENT

5. UNPACKING

a. Take care when unpacking or handling the equipment. Follow the procedure outlined below when unpacking the instrument.

(1) After removing top of packing case, lift the field strength meter from the packing case and remove the paper wrapping.

b. Check the components against the master packing slip. Inspect the equipment visually for damage after removal from the packing case. If damage is evident, note the nature, extent, and possible cause. Notify the shipping company concerned and Measurements Corporation immediately.

6. PRELIMINARY PRECAUTIONS

a. Do not connect line cord to d.c. or to 220-volt line.

b. Do not depress CAL or ADJ buttons except when calibrating.

SECTION II

CONTROLS AND INSTRUMENTS

See Figure 1.

7. Vernier Tuning Knob and Frequency Range Push Buttons

a. Controls the tuning of the input and converter stages in five frequency bands. Frequency range is selected by one of the five frequency range buttons underneath the tuning knob.

8. Four Decade Push Buttons

a. Four push buttons, X1, X10, X100, X1K, select input signal attenuation. MICROVOLTS meter readings must correspondingly be multiplied. (Buttons are also marked in DB, which must be added to the meter reading.)

9. CW ZERO Push Button

a. Control for shorting out the antenna or incoming signal. (See Par. 28-B).

10. CAL Knob and CAL Push Button

a. Controls for setting the MICROVOLT meter pointer to the calibration number indicated by the dial in the center of the instrument panel marked CALIBRATION. This operation calibrates the sensitivity or gain of the receiver.

11. ADJ Knob and ADJ Push Button

a. Controls for setting the MICROVOLT meter pointer opposite the region marked ADJ. This operation adjusts the filament current of the noise diode.

12. OFF Push Button

a. Turns power to the instrument off when depressed.

13. METER ZERO Knob and METER ZERO Switch

a. Controls for setting the MICROVOLT meter pointer to zero position. (Standard Procedure - Par. 28-A).

14. LOG-LIN Switch

a. Selects either log or lin meter scale.

15. MEGACYCLES Dial

a. Indicates the frequency in megacycles to which the instrument is tuned.

16. I.F. ATTEN. Knob

a. Two position rotary switch for X1 and X10 attenuation of I.F. input signal. (Switch is also marked 0 DB and 20 DB.)

17. EXT. METER Jack

a. Three-conductor telephone jack for connecting 0-1 milliampere meter, graphic recorder, etc., used with PL68 plug.

18. PEAK Knob

a. Controls a bucking voltage applied to detector for indication of peak voltages.

19. CALIBRATION Dial

a. Shows the calibration number to be used in conjunction with CAL knob and push button to calibrate the sensitivity of the receiver at the frequency in use. This control rotates with the MEGACYCLES scale pointer.

20. MICROVOLTS Meter

a. Used for the calibration of sensitivity and the indication of signal strength.

21. ANTENNA Jack

a. Indicates jack for connection of antenna cable.

22, PEAK, Q.P., AVG.

a. Three-position switch for changing detector to Peak, Quasi-Peak, or Average voltage reading circuit.

23. PHONES Jack

a. PL55 two-conductor jack for headphones and/or oscilloscope used with PL55 plug.

24. Megacycles Tuning Knob

a. Located directly beneath the MEGACYCLE dial (Par. 15). It is used to tune the instrument to the desired frequency.

SECTION III

OPERATION

25. INSTALLATION AND ADJUSTMENT

a. Since the Model 58-AS is portable test equipment, permanent installation is not necessary. A 117-volt a-c source is necessary. Selection, assembly, and connection of the required antenna (See Table III) complete the installation.

26. CONNECTIONS FOR OPERATION

a. Plug line cord into any standard 117 volt, 60-cycle, single phase a-c receptacle. The power consumption is 55 watts.

CAUTION: DO NOT CONNECT TO D-C OR TO 220-VOLT LINES.

b. When a-c power is not available, the instrument can be operated from a standard inverter using either a 6, 12 or 28 volt battery. Connect the line cord directly into the inverter socket. Select appropriate antenna as described in Table III.

27. PRELIMINARY OPERATIONAL CHECKS

a. Connect the unit as discussed in paragraph 26.

b. With the Antenna Cable disconnected, set controls as follows:

1. Depress "A" band button.
2. Set I.F. ATTEN. to "X1".
3. Set scale switch to "LIN".
4. Set the detector switch to "AVG".
5. Depress r.f. attenuator "X1" button.

TABLE III. ANTENNA AND INPUT SYSTEM CHART

Probe or Antenna	Remarks	Effective Height, Intensity Range, Frequency
9-inch loop	Useful for a great variety of radio field strength measurements and noise voltage disturbances in space.	1 cm at 15 Mc. and 2.5 cm at 150 Mc. permitting measurements from 100 to 100,000 mv/meter at 15 Mc and 400 to 100,000 mv/meter at 150 Mc (Figure 4).
* 3-inch loop	Useful for determining direction of current flow and for locating leaks in ignition shielding and the like.	Effective height 1/10 that of 9-inch loop. 0.1 cm at 15 Mc. and 0.25 cm measurements from 1,000 to 100,000 mv/meter at 15 Mc. and 4,000 to 100,000 mv/meter at 150 Mc. (Figure 4).
* Capacity Probe	For locating and evaluating stray fields caused by ignition systems and by electrical and electronic apparatus.	Not calibrated for effective height.
* 3-Lead Antenna Connector	Useful for coupling to specialized antenna system and low impedance circuits.	Make comparison test with standard antenna.
* High Impedance Probe	Useful for direct coupling in r-f voltage measurement and for using electrically short antenna.	No effective height data necessary. Probes are individually calibrated.
* Doublet Antenna	Permits measurement of lower field strength because of its increased effective height.	Effective height adjustable. Measurements from 1 to 50,000 uv/meter at 28 Mc and 10 to 100,000 uv/meter at 150 Mc. (Figure 4).

* Optional accessory equipment. See Chapter 4.

c. Observe the pilot lamp for operation.

d. Allow a few minutes to warm up.

e. Press METER ZERO switch and adjust ZERO knob to zero on the meter.

f. After releasing the METER ZERO switch, rotate the CAL. control clockwise. An internal noise deflection of at least 5% (1/2 microvolt) should be observed. The instrument is now ready for calibration. If the unit does not "check out" in any of the above steps, refer to Section III and Section IV.

28A. CALIBRATION PROCEDURE

General: - Before taking any measurements, the Model 58-AS must be calibrated at the particular frequency at which measurements are to be made. Calibration should be repeated whenever a large change in frequency or long periods of time are involved. This procedure standardizes the overall gain of the unit.

Recommended procedure calls for retention of the internal noise deflection when measuring noise. The type of noise is then taken into account to determine its value in the presence of internal noise.

1. Connect the equipment as outlined in Par. 26.

2. Depress the required frequency range button.

3. Allow fifteen minutes for the Model 58-AS to warm up.

4. During the warm up period, connect the desired antenna and associated equipment.

5. Press the METER ZERO switch and adjust the ZERO knob to zero on the meter. Release CAL. & ADJ. buttons by depressing the X1K Attenuator Switch Button.

6. Turn the Tuning Knob until the dial reads the desired frequency. Note the calibration number which appears on the CALIBRATION dial nearest the letter corresponding to the frequency band in use. (See Par. 28B).

7. Set I.F. ATTEN. to X1.

8. Set Detector Switch to AVG.

9. Set Meter Scale Switch to LIN.

10. Depress ADJ. button and operate ADJ. control until the MICROVOLTS meter indicates to the ADJ. mark on the meter face.

11. Depress CAL. button and operate the CAL. control until the meter points to the number noted in step 6.

12. Recheck ZERO by repeating step 5. Repeat step 11 if re-zeroing is required.

13. The instrument is now calibrated and ready for use.

CAUTION: The life of the noise diode will be greatly increased if the ADJ. control is returned to the full counter-clockwise position for each set-up, or adjustment, particularly if the power line voltage is varying over wide limits.

28B. ALTERNATE

When making field intensity measurements, and it is desired to zero out the internal noise on the maximum sensitivity range, calibration should be done using a standard signal generator in the following manner. See Figure 3.

a. Set I.F. ATTEN. to X10 (no signal).

b. Depress CW ZERO button.

c. Adjust ZERO knob until the meter reads zero.

d. Using special input Pad M-232, set signal generator to four times the full-scale meter reading multiplied by the attenuator setting to calibrate.

29. OPERATION AND USE

a. Set up and calibrate the equipment for the particular frequency of operation as outlined in Paragraph 28.

b. Move the detector switch either to PEAK, Q.P. (Quasi-Peak) or AVG. in accordance with the requirements of the particular measurements to be made. In general, PEAK is for measurement of absolute peak of signal or noise, Q.P. is used as a measure of annoyance factor for pulse and impulse noise, and will yield a nearly absolute peak for a signal having a high repetition rate. AVG. is for radio field strength measurements, and for audio and video monitoring.

c. Begin with the I.F. ATTEN. in the X10 position and the R.F. Attenuator X1000 button depressed. Progress to the next lower R.F. Attenuator Decade and to the I.F. ATTEN. finally, until a deflection as near as possible to full scale is obtained.

When detector switch is in PEAK position, the PEAK knob can be adjusted to give full scale and the attenuators manipulated as above until the noise is no longer heard on the phones. The PEAK knob is then readjusted until the noise is just barely audible.

The peak value of the noise signal in MICROVOLTS is 1.414 times the value indicated on the meter. In the case of impulse noise, convert this reading to Peak Microvolts/Mc by dividing the reading by the Impulse Bandwidth of the Model 58-AS (See Par. 3.g.)

d. For radio field strength measurements of carrier voltage, turn the MEGACYCLE pointer to the frequency in use. For noise and ignition measurements where tuning is not important except for antenna resonance, swing the MEGACYCLE pointer back and forth

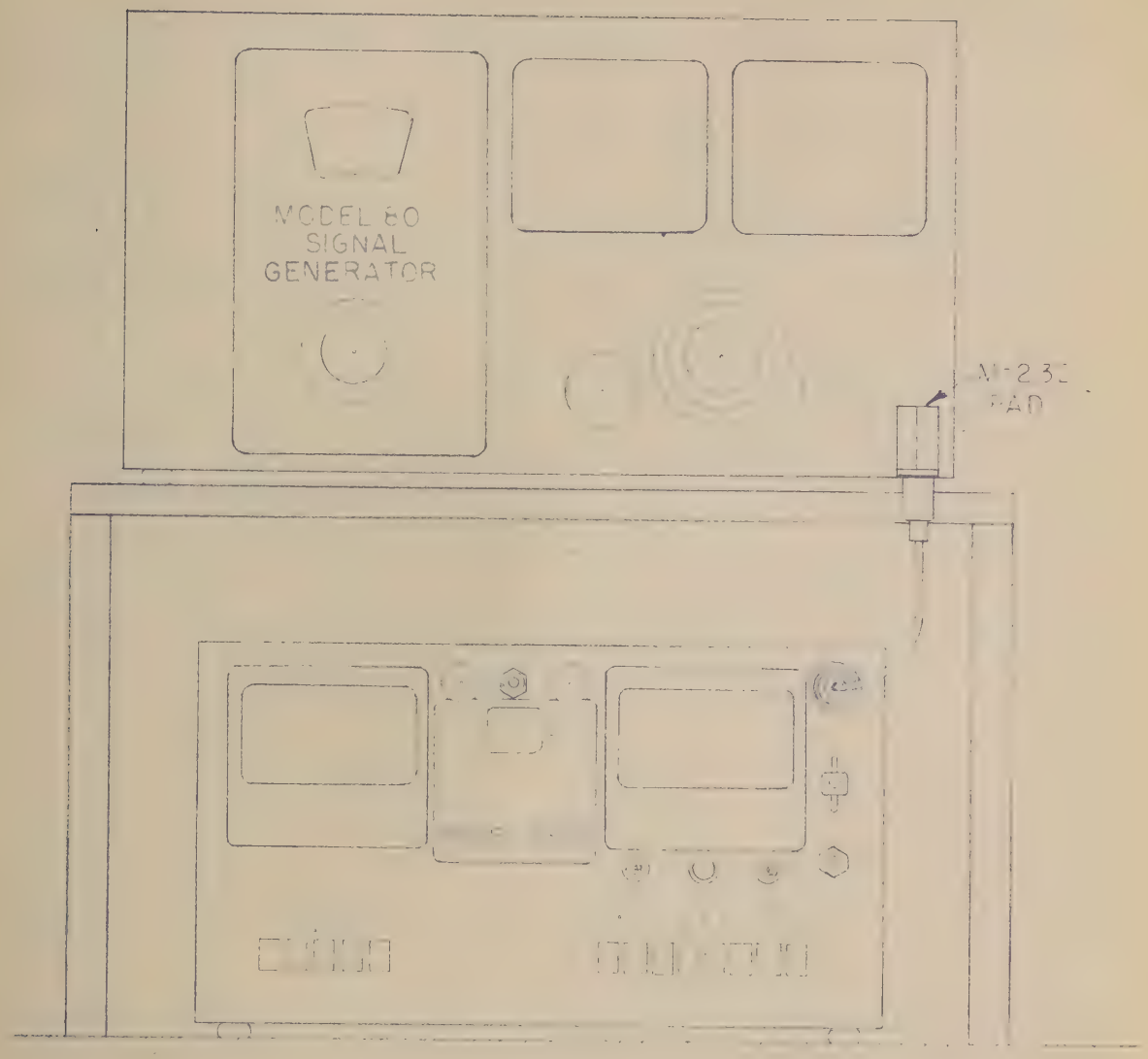


Figure 3. - Recommended Calibration Set-Up for Model 58-AS.

in the range of interest to avoid a carrier that may be superimposed on the noise voltage. If readings remain substantially the same, carrier is absent. A sudden upswing of the meter pointer within the arc of the swing indicates presence of carrier. Detune slightly if carrier is present. Noise voltage remains fairly uniform over a considerable frequency range.

e. For intermittent voltage measurements (pulse signals), ignition noise, and the like, if the MICROVOLT meter reading is between 60 and 100, depress the next higher attenuator button to check for overloading. Meter pointer should swing to 1/10 of its previous reading. If reading is higher than 1/10 of the original reading, overload was present. Record this new reading in such cases.

f. Depress and turn ZERO knob to reset MICROVOLT meter pointer to zero at occasional intervals during a long series of measurements. This is particularly necessary if Model 58-AS is battery operated because dropping battery voltage will cause shifting zero.

g. Monitor the signal under investigation, if desirable, with a pair of headphones or with an oscilloscope.

h. Depress OFF button to turn power off on a.c. operation.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

SECTION I

MAINTENANCE

30. GENERAL

a. Preventive maintenance procedure is not recommended for the Model 58-AS. Critical adjustments may be disturbed by too frequent inspection by personnel unfamiliar with the design of the Model 58-AS causing errors in data that would be much more serious than an occasional operational failure.

b. If failure occurs, the instrument should be checked by the procedure outlined in paragraph 27 (Preliminary Operational Checks), and if serious trouble is indicated, the instrument should be returned to Measurements Corporation.

c. For analyzing troubles, see Tables V. & VI.

CHAPTER 4

EQUIPMENT USED WITH MODEL 58-AS

SECTION I

GENERAL

31. RECOMMENDED ACCESSORIES

a. Optional accessories can be purchased as required to realize the maximum utility of the Model 58-AS. The optional and standard accessories listed in Table IV can be obtained as a unit with an accessory case.

32. ASSOCIATED EQUIPMENT

The following associated equipment, although not necessary, may be found useful:

a. A 6-volt STORAGE BATTERY capable of furnishing 9.5 amperes for use where an a-c source is lacking.

b. An Inverter to be used between instrument and battery to supply the necessary voltage.

c. A GRAPHIC RECORDER as an aid in making field strength surveys. The recorder used should employ a sensitive milliammeter carrying a direct current measuring element giving a full scale deflection on a current of 1 milliampere and having a resistance of approximately 1500 ohms. If the resistance is less than 1500 ohms, it will be necessary to make up the difference by adding a 1/2 watt resistor in series with the recorder. A PL-68 phone plug and a cable should accompany the recorder for connection to the jack marked Ext. meter on control panel.

d. An OSCILLOSCOPE to aid in studying noise patterns and in determining the nature of the signal. Monitoring with an oscilloscope can be effected by direct application to the PHONE jack on the instrument panel. In this connection, however, it should be remembered that the output system of the Model 58-AS is not designed for video amplification, but will give a reasonable performance up to 100 Kc if capacity loading is kept small.

e. A HIGH IMPEDANCE PROBE for coupling the Model 58-AS to an external circuit for measuring r-f voltages without disturbing the external circuit is available. (Measurements Corporation Model 58-Z12).

TABLE IV. ACCESSORY KIT LIST

Quantity	Item	Type Number	Overall Dimensions
1	Accessory Case	H-217	40 x 10 x 3 in.
1	* 15-foot antenna cable	H-112	Length: 15 ft.
1	3-foot antenna cable	H-213	Length: 3 ft.
1	* 9-inch loop antenna	H-110	Diameter: 9 in.
1	3-inch loop antenna	H-211	Diameter: 3 in.
1	Capacity probe antenna	H-212	Length: 3-1/2 in.
1	Doublet antenna stand	H-1108	Length folded 30"
1	Doublet extension tube	H-1165, Pt 3	Length: 3 ft. Diameter: 1 in.
1	Doublet extension tube	H-1165, Pt 2	Length: 3 ft. Diameter: 7/8 in.
1	Doublet extension tube	H-1165, Pt 1	Length: 3 ft. Diameter: 3/4 in.
1	Doublet antenna holder	H-215	
2	Long antenna rods	H-220, Pt 1	Length: each 3 ft.
2	Short antenna rods	H-220, Pt 2	Length: each 1-1/2 ft.
1	Headphone assembly		
1	* Phone Plug Filter	H-5929	1 dia. x 2-5/8 lg.
	Weight of accessories and case (approx.)		20 lbs.
	Shipping Weight		25 lbs.

* Supplied with Model 58-AS.

Additional Accessories Available

58-Z12 High-Impedance Probe.

M-232 Calibrating Network, 50 ohms unbalanced to 72 ohms balanced.

CHAPTER 5

APPLICATION OF MODEL 58-AS AND INTERPRETATION OF RESULTS

SECTION I

GENERAL

33. ACCURACY

a. The accuracy attainable in practice depends upon the design of the equipment, the conditions under which the measurements are taken, and the technique in operating the instrument. Under usual operating conditions the error should not exceed 30 percent provided the instrument is properly operated. This accuracy is sufficient for most applications.

34. RADIO NOISE INTERFERENCE AND PULSE MEASUREMENTS

a. The measurement of radio noise interference and of pulse signals involves a number of factors which are not present when measuring c-w signals. The problem has been studied for a considerable period of time by the Joint Coordination Committee of the Edison Electrical Institute, National Electrical Manufacturers Association, and the Radio Manufacturers Association. The work of the committee led to the conclusion that a reasonable measurement of annoyance can be made with a diode detecting circuit with appropriately chosen values of the charge and discharge time constants. The mark-space ratio of the pulse must be greater than the charge/discharge time constants of the peak detector before peak reading is approached. Below this point readings then become a function of the three dimensions of the pulse: amplitude, duty cycle, and repetition rate.

b. The charge to discharge ratio of the Quasi-Peak detector of the Model 58-AS is 1/600 conforming to ASA Standards for such types of radio noise measurements. When reading near 100 microvolts on the output meter, depressing the X10 attenuator button should cause a reduction of 1/10. This may not occur because of the changing nature of the diode conducting resistance which causes meter indications to be less than expected. Overload when measuring pulses shorter than five microseconds tends to cancel out the above discrepancy, thus causing the output meter to read higher than it should. To avoid this masking or cancelling effect, depress the next higher attenuator button and see whether overload is present. Overload is frequently encountered when probing the induction field in the vicinity of the ignition distributor, etc., since the induction field has a much steeper wave front and is of shorter duration than the radiated field.

c. The aural slide-back Peak detector incorporated in the Model 58-AS permits the accurate measurement of the peak value of signals. This Peak detector is particularly important for the proper measurement and evaluation of interference of the impulse type.

35. USE OF ANTENNAS

a. Measuring an r-f signal or noise field in space involves intercepting the field with a collector or antenna, amplifying that voltage (in a receiver) and converting it to an indication on the scale of a meter. To impart accuracy to the measurement, a standard for comparison must be included. The measurement of r-f voltage is accomplished by first calibrating the receiver against the standard, recording the meter reading, and computing the result from the known constants of the system.

The magnetic component of the field will be measured when using the loop antenna provided for use with the Model 58-AS. The half-wave doublet will respond to the electric component of the field. The so-called "effective height" of an antenna is significant only in a pure radiation field. For the case of the one-half wave doublet antenna, the effective height, h, can be calculated from

$$h = \frac{\lambda}{\pi}$$

where λ = wave length in meters.

b. For an unshielded loop type antenna, the effective height in meters can be calculated from the formula

$$h = \frac{2\ \pi\ nA}{\lambda}$$

where n = number of turns in the loop,
A = area of the loop in square meters,
λ = wave length in meters.

(The Model 58-AS loop has one turn). The loop antenna response is a maximum when the plane of the loop is parallel to the direction of wave travel or current flow and at right angles to the magnetic vector component. Therefore, direction of the current flow can be easily determined with the loop probe antenna, and because of its directional properties, the loop probe will be found more useful for locating leaks in ignition shielding than the capacity probe antenna.

c. The effective height of an antenna, which is short as compared to a wavelength, is equal to half the physical length in meters.

36. RADIO FIELD STRENGTH MEASUREMENTS

a. Measurement of radio field strength with the Model 58-AS involves measuring the voltage induced across a standard antenna by the field to be measured and computing the radio field strength from the measured voltage and the effective height of the antenna.

The effective heights of a half-wave doublet antenna and the loop antennas are plotted in Figure 4. The loss in the 15-foot antenna connecting cable is negligible up to 150 Mc. If longer cables are to be used, it is advisable to measure and correct for their transmission loss. The effective height data in Figure 4 for the loops will not apply to cables other than the standard 15-foot length. The adjustable doublet antenna furnished as an accessory to the Model 58-AS is continuously tunable from 28 to 150 Mcs. For measurements below 28 Mc. special methods, as mentioned in Table III should be used.

b. Where greater sensitivity is desirable, it is possible to calibrate the Model 58-AS at higher equivalent microvolts of shot noise if sufficient gain can be obtained. To accomplish this, use a higher calibration number during the calibration procedure. Correct for this in the final calculations by multiplying by the ratio of

$$\frac{\text{original calibration number}}{\text{higher calibration number}}$$

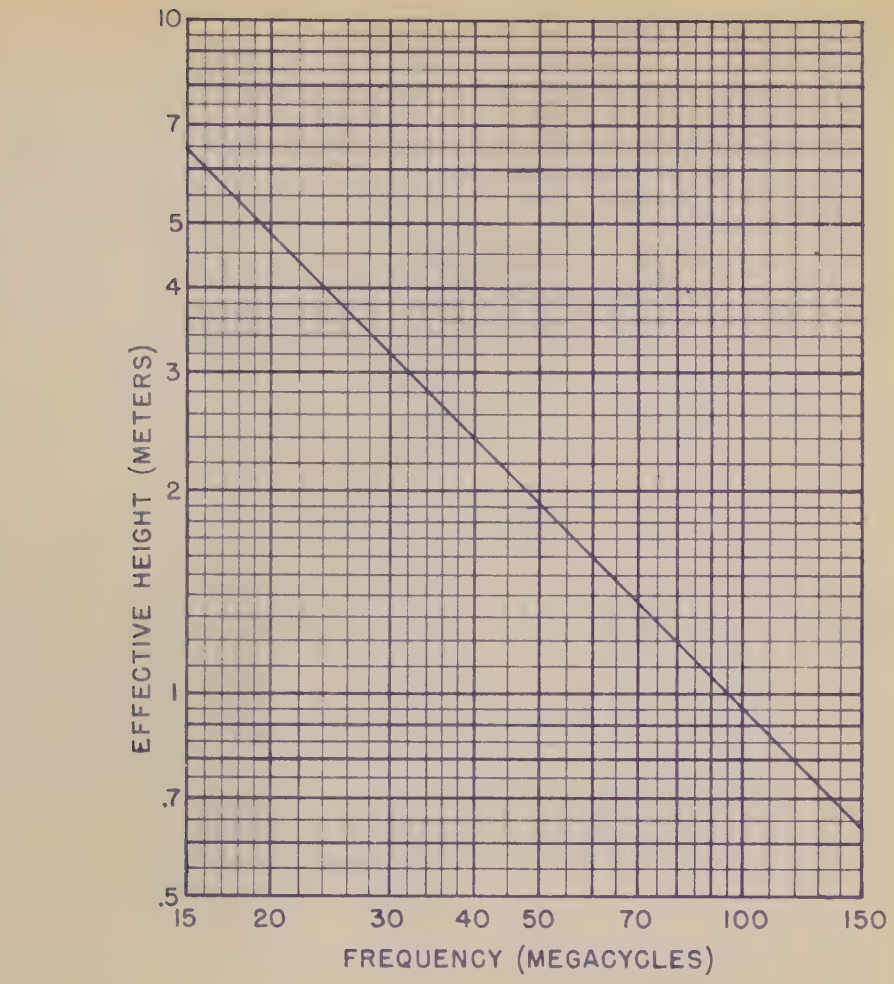
A typical computation is shown in subparagraph 41b. At some frequencies it is possible to calibrate at twice the equivalent microvolts and thus obtain twice the sensitivity. This procedure is limited by the signal-to-noise existing at the plate of the r-f amplifier tube.

37. POWER LINE NOISE MEASUREMENTS

a. The measurement of power line noise should be made in accordance with MIL-I-6181. When noise levels are extremely high, additional power line filtering for the Model 58-AS may be necessary in the test set-up. The High-Impedance probe serves to couple the line to the input of the Model 58-AS.

CAUTION:

NEVER CONNECT THE POWER LINE DIRECTLY TO 3-TERMINAL ANTENNA CONNECTOR.



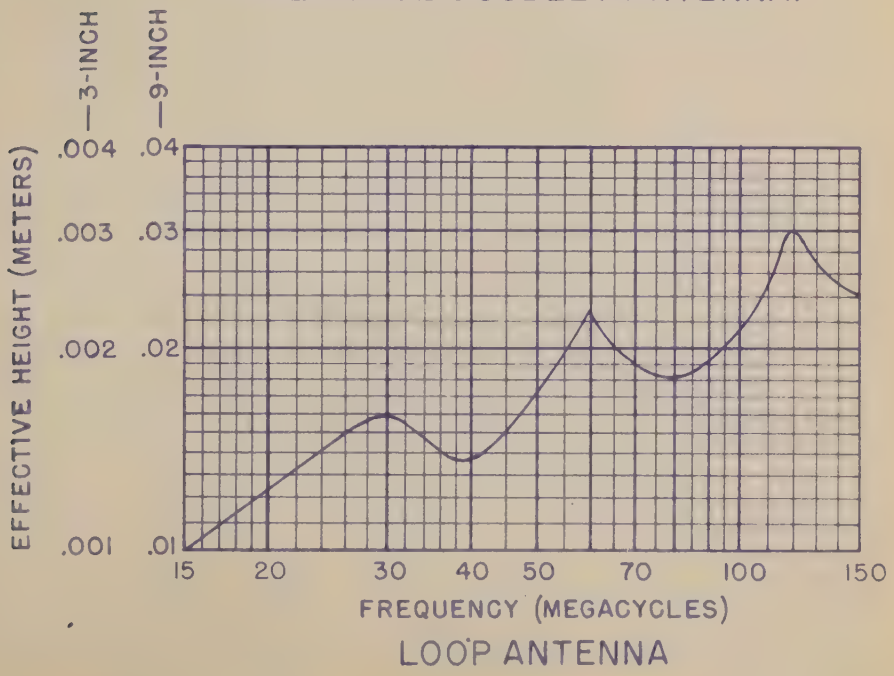


Figure 4. - Effective Height Of Antennas.

38. VOLTAGE RATIO MEASUREMENTS

a. The Model 58-AS can be used in conjunction with a suitable standard signal generator to measure the transmission loss of four-terminal networks such as interference filters, band-pass filters, etc.; front-to-back ratios of directional antennas; signal-to-noise ratios existing on antennas; and the like. In most of these cases, the Model 58-AS will provide more reliable indications than an untuned type of voltmeter.

b. The relative accuracy of the Model 58-AS is best when the pointer is on the upper half of the scale. Adjust signal intensity when possible to keep the meter pointer well up on the scale.

39. MODEL 58-AS AS R-F VOLTMETER

a. The Model 58-AS is a tuned vacuum-tube voltmeter having an input resistance of 72 ohms balanced to ground. The AVERAGE, QUASI-PEAK and PEAK readings of the Model 58-AS are calibrated in terms of the root-mean-square value of a continuous sine-wave voltage applied across the 72-ohm input. Although the PEAK aural slide-back detector responds to the peak value of the envelope of the signal applied to the detector, it is calibrated in terms of the r.m.s. value of a sine wave having the same peak value. Therefore, if it is desired to measure the peak magnitude of a signal, it is necessary to multiply the reading of the PEAK slide-back detector by 1.414.

b. If it is desired to measure a voltage originating in a source which is unbalanced to ground, it is necessary to use an appropriate pad such as Measurements Model M-232, 4 to 1 voltage ratio Pad designed to connect 50-ohm unbalanced circuits to the 72-ohm balanced input of the Model 58-AS. Another device which can be used to measure voltages in unbalanced circuits is Measurements Model 58-Z12 high-impedance probe which is supplied with a set of calibration curves.

c. The meter reading on the Model 58-AS multiplied by the R-F and I-F Attenuator settings is the magnitude of the voltage connected to its input terminals in r.m.s. microvolts.

d. The Decibel scale on the meter is calibrated in terms of db above one microvolt r.m.s. across the 72-ohm input of the Model 58-AS. This meter reading in db added to the R-F and I-F Attenuator db settings is the relative magnitude of the voltage connected across the 72-ohm input of the Model 58-AS in db above one microvolt r.m.s.

SECTION II

INTERPRETATION OF RESULTS

40. GENERAL

a. The Model 58-AS is calibrated in terms of the r.m.s. value of a sine-wave signal applied across the balanced 72-ohm input.

b. When input pads, probes, loop antennas or dipole antennas are used with the Model 58-AS, the pertinent loss, calibration factor, or effective height must be utilized in making computations of voltage, or of field strength.

c. Meter readings taken on the AVERAGE, QUASI-PEAK and PEAK detector positions are in terms of the r.m.s. value of a sine wave signal which will produce the same reading as the signal being measured. Therefore, if a signal is measured with the PEAK aural slide-back detector and the peak amplitude of this signal is desired, the meter reading must be multiplied by 1.414. Pulse voltage readings taken in the QUASI-PEAK detector position must be interpreted properly in terms of the duty cycle and repetition rate of the pulse.

41. RADIO FIELD STRENGTH MEASUREMENTS

a. The following procedure is for the computation of the magnitude of radio-frequency signals emanating from the following: AM or FM radio stations, etc.; continuous-wave (CW) or modulated continuous-wave (MCW) interfering signals such as those emanating from receivers, diathermy equipment, etc.

(1) Record meter reading obtained in Average detector position. This is in r.m.s. microvolts.

(2) Record RF Attenuation and IF Attenuation factors.

(3) Obtain the effective height of the antenna used for the frequency employed from Figure 4.

(4) Substitute in the following equation and solve:

$$\text{Microvolts (rms) per meter} = \frac{2 \times (\text{microvolts reading})\ (\text{RF Atten.})\ (\text{IF Atten.})}{(\text{antenna effective height})}$$

NOTE:- (a) The factor 2 takes into account the 2 to 1 loss in voltage which takes place when the 72-ohm antenna is connected to the 72-ohm input of the Model 58-AS.

(b) The factor 2 should also be used if a loop antenna is employed, because the effective height curves in Fig. 4 for the loop antennas were measured on this basis.

(c) If it is desired to compute the r.m.s. microvolts induced in the antenna remove the denominator in the above equation and solve.

b. If the gain of the Model 58-AS is standardized at a higher than normal value as described in Paragraph 36b, multiply the value of the field strength by the following ratio:

$$\frac{\text{original calibration number}}{\text{higher calibration number}}$$

42. NOISE MEASUREMENTS

a. The following procedure is for the computation of the magnitude of broadband radiated interference such as that caused by electrical impulses.

(1) Record meter reading obtained in Peak detector position (or Quasi-Peak detector position if the relative nuisance value of the noise is desired). In either case the reading is in equivalent sine wave r.m.s. microvolts.

(2) Record RF Attenuation and IF Attenuation factors.

(3) Obtain the effective height of the antenna used for the frequency employed from Figure 4.

(4) Obtain the Impulse Bandwidth of the Model 58-AS in kilocycles as listed in Paragraph 3g.

(5) Substitute in the following equation and solve:

Peak Microvolts/Meter/Kc =

$$\frac{2 \times 1.414 \text{ (microvolts reading) (RF Atten.) (IF Atten.)}}{\text{(Antenna effective height) (Impulse bandwidth in Kc)}}$$

NOTE: (a) The factor 2 is explained in Paragraph 41-a.

(b) The factor 1.414 converts the r.m.s. meter reading to a peak reading. Omit this factor if the r.m.s. sine wave equivalent of the peak microvolts is desired.

(c) If it is desired to compute the microvolts induced in the antenna, remove the factor (Antenna effective height) in the denominator of the above equation.

CHAPTER 6

TECHNICAL SERVICE-MAINTENANCE INSTRUCTIONS

SECTION I

GENERAL

43. SCOPE

a. The purpose of this chapter is to acquaint operating and maintenance personnel with the theory of operation of the various circuits in the Model 58-AS VHF Field Strength Meter.

SECTION II

CONDENSED THEORY OF OPERATION

44. GENERAL

a. A block diagram of the Model 58-AS is shown in Figure 5. The Model 58-AS receiver is a laboratory type superheterodyne designed for reception in the range from 15 to 150 megacycles. The receiver provides a balanced input attenuator, a shot-noise calibrator or standard signal level source, and a special output stage from which the signal strength is indicated on a one-milliampere meter calibrated in microvolts r.m.s. The output circuitalso permits monitoring of the signal with headphones, an oscilloscope, and/or a graphic recorder. The characteristics of the receiver are given in Paragraph 3.

45. PHYSICAL DESCRIPTION

a. The Model 58-AS is housed in a case 15-11/16" long x 8-3/4" high x 9-1/2" deep overall. Three sub-sections comprise the receiver. These sub-sections are the r-f amplifier, converter, and oscillator assembly; the i-f, output, I-F Attenuator and power supply assembly, and the attenuators.

46. INPUT ATTENUATOR

a. This attenuator consists of fourteen carbon composition-type resistors connected in a balanced-to-ground ladder network. Four sections of the operations switch select proper combinations of these resistors to provide attenuation steps of X1, X10, X100, and X1000. The terminal resistance for each of these steps remains at 72 ohms. The attenuator block and the push-button switch are mounted at the front end of the i-f assembly.

47. R-F AMPLIFIER, CONVERTER, AND OSCILLATOR

a. The r-f amplifier, converter and oscillator coil assemblies with their associated components are housed in a copper shield.

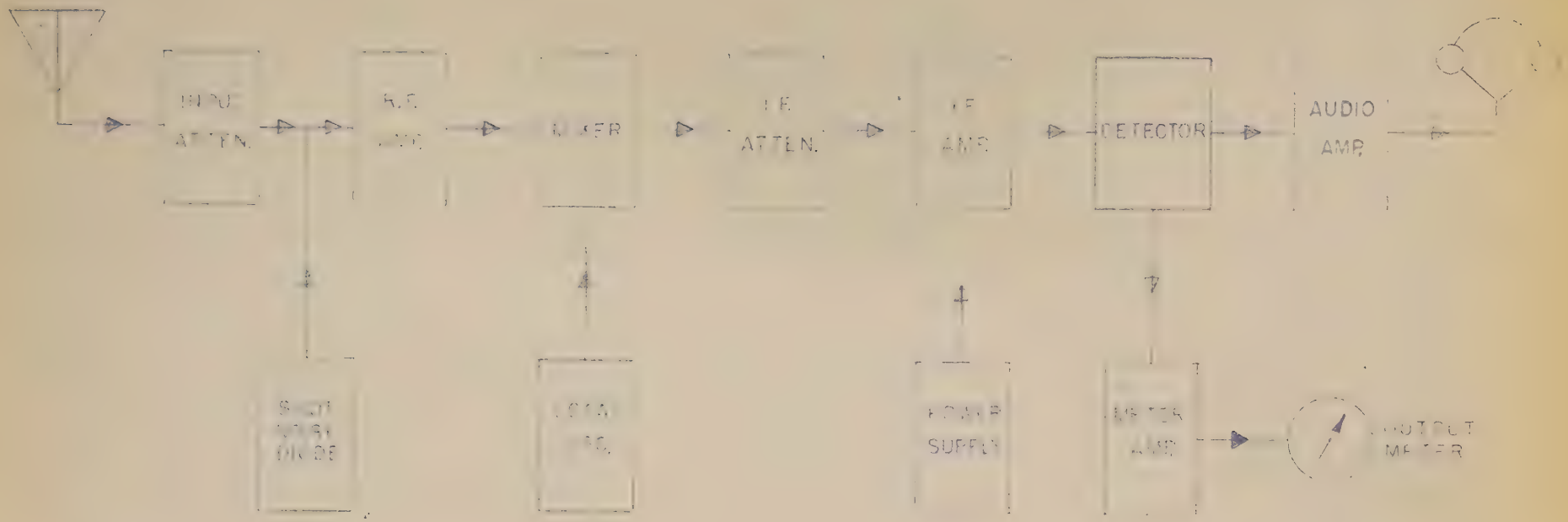


Figure 5. - Block Diagram Of Model 58-AS.

This assembly is divided into three sections by stages which are shielded from each other by aluminum plates. The assembly includes the dial drive mechanism and is secured to the left side of the front panel. A shielded single bayonet-type connector feeds the i-f signal to the i-f sub-assembly.

b. Signals from the attenuator are selected by a push-button type switch which selects the proper coil for the required band. The r-f stage employs a type 6AK5 tube, V-1. The CAL control, R48, adjusts the screen voltage of this tube and V2, thereby setting the gain of the receiver. Bias is fixed by cathode resistors.

c. A separate oscillator tube, V-3, and converter tube, V-2, are used to convert the antenna signal frequency to 12 megacycles for further amplification in the i-f stages. The oscillator tunes 12 megacycles above the signal frequency except on the E band, where it tunes 12 megacycles below the signal frequency.

48. I-F AMPLIFIER

a. An aluminum chassis secured to the right side of the front panel houses the i-f, output, and power supply sub-assembly. The input to the first I-F Amplifier is connected to the I-F Attenuator which consists of three composition type resistors, to provide the desired I-F attenuation step X10. Three i-f amplifier stages employing type 6CF6 tubes are used in the Model 58-AS. At the output of this amplifier, the secondary of the i-f transformer (T5) is untuned and feeds a type 6AL5 diode detector, V8, whose diode plates are connected in parallel. R-f and i-f voltages are removed from the detector output by suitable choice of filter constants with a minimum attenuation of the high-frequency modulation components.

b. The variable resistors, R41-42 are connected in the cathode returns of the first and second i-f tubes and provide a factory adjustment for i-f gain. The potentiometer, R32, in the diode detector return circuit provides another factory adjustment for automatic gain control. The LOG scale of the MICROVOLT meter is obtained by careful adjustment of these controls.

49. METERING AND MONITORING CIRCUITS

a. The output of the detector feeds a type 12AU7 amplifier tube, (V10) and an audio amplifier tube, V9. Signals fed to the V10 (12AU7) alter the plate-to-cathode resistance, in proportion to the signal strength, and upset the balance of the bridge. Any change in the balance of the bridge will cause a proportional indication on the meter. A three-position switch (PEAK, QUASI-PEAK, AVERAGE, S5) is connected to the input circuit of V10. For Peak indication, a Slide Back resistor R-35 is used to determine a reference voltage for the detector, a capacitor (C35) is connected across the circuit to obtain Quasi-Peak indications. C35 is disconnected for AVERAGE indications.

The potentiometer R57 in the bridge circuit permits initial ZERO adjustment of the meter. EXT meter connections are in the plate circuits of the V10 tube. Phone connections are in the plate circuit of the V9 audio amplifier.

50. POWER SUPPLY

a. The Model 58-AS employs an internal power supply which uses a full-wave rectifier, separate heater winding and a glow tube regulator for critical tube voltages. The instrument operates from 117 volts, 50-60 cycles A.C. or may be used with a standard D.C. to A.C. Inverter for operation from storage batteries of 6, 12, or 28 volts. The use of r-f chokes and special capacitors assures thorough filtering of the input circuits to minimize surge voltages and r-f interference.

b. The OFF button disconnects the A.C. input when depressed.

51. HIGH-IMPEDANCE PROBE

a. The high-impedance probe is a tunable transformer used in coupling the Model 58-AS to an external circuit or antenna for measuring r-f voltages, transmission loss of various four-terminal networks, and for determining interference level on power lines, battery leads, and the like. It is also useful in adapting special antennas to the Model 58-AS.

b. The r-f voltage from the external circuit under investigation is coupled to the probe by a 1.0 mmf capacitor. This small value of capacitance is chosen to permit connection to the circuits with minimum disturbance. Five r-f transformers are provided, one for each of the five ranges of the Model 58-AS. A two-circuit rotary switch connects the proper coil to the circuit and a variable capacitor tunes the primary to resonance. An attenuation factor is introduced by the use of the probe and it is advisable to standardize the Model 58-AS together with its individual probe. Calibration procedures and a attenuation factor chart will be supplied with probe.

52. CALIBRATION

a. The Model 58-AS uses a type 5845 miniature diode operated under temperature-limited conditions as a shot noise generator for calibrating the sensitivity of the receiver. The output of this shot noise generator is fed into the input of the r-f amplifier when the CAL button is depressed. As the MEGACYCLES pointer is rotated, the CALIBRATOR dial indicates the value of the effective noise voltage output of the noise generator in microvolts to which the gain of the Model 58-AS must be adjusted for the frequency and bandwidth involved. When the receiver gain (CAL knob) is set properly, the MICROVOLTS meter will indicate this value, and the gain of the Model 58-AS will be properly standardized.

b. It has been found necessary to sacrifice some gain in the input circuit of the Model 58-AS to minimize the effects of input circuit impedance variation on the transmission line termination. A compromise has been used which reduces the sensitivity by approximately 6 db. The limiting factor in sensitivity lies in the signal-to-noise ratio in the antenna circuit and the fact that it is not possible to utilize the maximum gain of the receiver because a margin of reserve must be allowed for calibration or standardization purposes.

SECTION III

TROUBLE LOCATION

53. REPAIRS

a. In the event of failure of any of the functions of the Model 58-AS, it is recommended that the instrument be returned to MEASUREMENTS CORPORATION for repair. However, there are a few simple checks which may indicate a component failure which can easily be repaired in the field.

54. ANALYSIS OF TROUBLE

a. It is strongly recommended that a complete analysis of any trouble be made before attempting any repairs. Only after a thorough check of the meters and controls on the front panel is made, and it is decided to attempt the repair in the field, should the instrument be removed from its case.

b. Repairs, electrical alignments, or replacement of parts, if attempted, should be made in a properly equipped laboratory by experienced maintenance personnel.

c. For detailed instructions concerning stripping and realignment of the Model 58-AS, write to Measurements Corporation.

d. Trouble may be localized by making the preliminary operational checks outlined in paragraph 27 and by reference to the Trouble Shooting Chart, Table V and the Tube Voltage and Resistance Chart, Table VI.

TABLE V. TROUBLE SHOOTING CHART

TROUBLE	POSSIBLE CAUSE	REMEDY
No signal	Blown fuse.	Replace fuse.
	Break in continuity of power cord, possibly at plug.	Locate and repair. Seat power plug firmly against panel.
	Shorted filter or by-pass capacitor.	Locate and replace capacitor.
	Poor contact between antenna cable receptacles and mating plugs.	Locate and correct. Tighten coupling rings securely.
	Burned-out vacuum tube.	Locate and replace tube.
MICROVOLT meter will not zero	Defective V10 tube.	Replace V10.
	Short-circuited meter by-pass capacitors, C73, C92, C76, C77 or C74.	Locate and replace capacitors.
	RECORDER jacks short-circuited to ground.	Locate and correct.
	Defective resistors R51, R52, R60, R57, R58, R55 or R56.	Locate and replace resistor.
MICROVOLT meter cannot be set to ADJ.	Wrong button depressed.	Depress ADJ button.
	Defective push-button switch.	Locate and replace.
	Defective V4 tube.	Replace tube.
	Defective resistor, R-59.	Locate and replace.
	Pins 1 & 3 not making contact in Plug P2.	Locate and adjust.

TABLE V. TROUBLE SHOOTING CHART

TROUBLE	POSSIBLE CAUSE	REMEDY
MICROVOLT meter cannot be set to appropriate CALIBRATION number.	Wrong button depressed.	Depress CAL.
	Low Supply Voltage. (See below)	(See below)
a. On all bands.	Defective tubes.	Check and replace.
	I.F. misaligned.	Re-align I.F. *
b. One band only.	R.F. mis-aligned.	Re-align R.F. *
	Defective band switch.	Locate and repair switch.
Low Supply D.C. voltage.	Defective tubes, V11 and V12.	Check and replace.
	Defective capacitors, C81 and C82.	Check and replace.
	R76 Defective.	Check and replace.
Weak signal	Weak tube.	Locate and replace tube.
	Mis-alignment of r-f or i-f circuits.	Check and re-align. *
Intermittent noise during tuning.	Loose or dirty wipers on gang tuning capacitor.	Clean and tighten wipers.
Intermittent noise caused by vibration.	Defective or dirty contact on operations or frequency range switches.	Locate and correct.
	Microphonic tube.	Locate and replace.

TABLE V. TROUBLE SHOOTING CHART

TROUBLE	POSSIBLE CAUSE	REMEDY
Intermittent reception.	Connecting cables loosely mated.	Locate and correct.
	Defective control	Locate and replace control.
	Poor contact between tube and socket.	Locate and correct.
	Defective tube.	Locate by tapping each tube lightly; then replace defective tube.
	Frayed or broken connection in wiring.	Locate and correct.
	Defective by-pass or coupling capacitor.	Locate and replace.
	Loose retaining nut on shield can.	Locate and tighten nut.
Signal evident in headphones, but MICROVOLT meter does not indicate.	Open or shorted connection in output bridge circuit.	Locate and correct.
	Defective MICROVOLT meter.	Check meter and return it to MEASUREMENTS CORPORATION for repair.
	Defective V10 tube.	Replace.
CALIBRATION scale and MEGACYCLE pointer does not rotate as tuning knob is turned.	Broken or loose dial cord.	Tighten or replace dial cord.

TABLE V. TROUBLE SHOOTING CHART

TROUBLE	POSSIBLE CAUSE	REMEDY
Attenuator buttons do not reduce or increase readings in proper proportion.	Poor switch contacts. Defective or open resistor in attenuator block.	Locate and clean contacts. Locate and replace resistor.
Smoke	Rotor insulation failure on tuning capacitor due to arcing, especially at high altitude, which shorts B+ and burns out resistor R5 or R14. Shorted by-pass or filter capacitor.	Keep insulator segments clean and dry. If badly carbonized, return to MEASUREMENTS CORPORATION for replacement. Check and replace resistors, if necessary. Locate and replace capacitor.
B+ more than 225 volts unregulated and 150 volts regulated.	Defective voltage regulator tube, V12. Defective filter capacitor, C81 and C82. B+ shorted to ground.	Replace regulator tube. Replace capacitor. Locate and correct short.
No output from phones.	Defective tube V9. Open condenser C33 or C65.	Replace tube. Replace capacitor.
	* For realignment procedures write to MEASUREMENTS CORPORATION.	

SECTION IV

REPAIR PROCEDURES

55. REMOVING MODEL 58-AS FROM ITS CASE

a. Disconnect all cables from the Model 58-AS.

b. Remove the two screws from the back of the case. Remove the fifteen binding head screws from around the front panel perimeter.

c. Up-end the instrument with front panel facing upward.

d. Gently lift the instrument from the case using the handles provided on front panel. After removing, rest the instrument on the panel guards.

56. REPLACING MODEL 58-AS IN ITS CASE

a. To return the instrument to its case, set the case with the opening facing upward.

b. Grasp front handles on panel, lift to position over opening in case, and gently lower.

c. Replace fifteen panel screws, and two screws in back of case, centering the instrument carefully over the holes before securely tightening any of the screws.

SECTION V

CIRCUIT DATA

57. VOLTAGE AND RESISTANCE MEASUREMENTS

The voltage and resistance measurements, Table VI, give readings between the respective points indicated and the chassis under the conditions listed. Variation of more than 20 per cent from the values shown indicates trouble in the circuit being measured or in directly connecting circuits.

a. Measure voltages under the following conditions:

1. Employ 20,000 ohms-per-volt meter.

2. Use line voltage of 117-volt, 60-cycle, a.c. input, except where indicated.

3. Set Band "A" MEGACYCLE pointer at 24 Mc.

4. No signal input.

5. Set panel controls full counterclockwise, except where indicated.

6. Depress "A" band and CW Zero push buttons, except where indicated.

7. Remove tube from the socket under test, except where indicated. Make sure that all other tubes are in place.

8. Set Scale Switch to Linear.

b. Measure resistances under the following conditions:

1. Use any standard ohmmeter having the appropriate ranges.

2. Disconnect all cables, and do not connect the Model 58-AS to a power source.

3. Set panel controls full counterclockwise, except where indicated.

4. Depress "A" band and CW ZERO push buttons, except where indicated.

5. No signal input.

c. Measure attenuator resistances as follows:

1. Do not connect the Model 58-AS to a power source.

2. Attach antenna cable to the Model 58-AS.

3. Connect ohmmeter to antenna cable end terminals.

4. Release all range buttons by partly depressing each button.

5. Depress attenuator buttons one by one and read ohmmeter for each one. The meter should read 72 ohms for each, if none of the attenuator resistors is defective.

6. Repeat procedure above from each line to the center terminal. Ohmmeter should read approximately 36 ohms.

TABLE VI. VOLTAGE AND RESISTANCE CHART

TUBE OR TERMINAL	PIN	VOLTS	OHMS	CONDITIONS
V1 6AK5 R-F Amplifier	1 2 3 4 5 6 7	0 0 0 6.3 a.c. +150 +150 0	200K INF 0 0 70K 70K 220	"CAL" control clockwise
V2 6AK5 Converter	1 2 3 4 5 6 7	0 0 0 6.3 a.c. +150 +150 0	200K INF 0 0 70K 90K 500	- "CAL" control clockwise
V3 955 Oscillator	1 2 3 4 5	0 +150 0 6.3 a.c. 0	0 70K 15K 0 0	
V4 Shot Noise Diode	1 2 3 4 5 6 7	+125 0 0 5.0 a.c. 0 0 5.0 a.c.	90K INF 0 1.0 INF INF 0.5	Tube in socket CAL. Button depressed ADJ Pot clockwise
V5 6CF6 1st - I.F. Amplifier	1 2 3 4 5 6 7	0 +0.6 6.3 a.c. 0 +225 +150 0	1.5M 700 0 0 80K 80K 0	

TABLE VI. VOLTAGE AND RESISTANCE CHART

TUBE OR TERMINAL	PIN	VOLTS	OHMS	CONDITIONS
V6 6CF6 2nd - I.F. Amplifier	1 2 3 4 5 6 7	0 +0.6 6.3 a.c. 0 +225 +150 0	1.5M 700 0 0 80K 80K 0	
V7 6CF6 3rd I.F. Amplifier	1 2 3 4 5 6 7	0 0 0 6.3 a.c. +225 +150 0	0 250 0 0 70K 80K 0	
V8 6AL5 Detector	1 2 3 4 5 6 7	0 0 6.3 a.c. 0 0 0 0	0 50K 0 0 0 0 50K	Det. switch to AVG.
V9 6AK6 Audio Amplifier	1 2 3 4 5 6 7	0 0 0 6.3 a.c. +225 +150 0	1.0M 0 0 0 90K 70K 15K	
V10 12AU7 Meter Amplifier	1 2 3 4 5 6 7 8 9	+225 0 0 6.3 a.c. 6.3 a.c. +225 0 0 0	80K 1.5M 1K 0 0 80K 0 1.2K 0	

TABLE VI. VOLTAGE AND RESISTANCE CHART

TUBE OR TERMINAL	PIN	VOLTS	OHMS	CONDITIONS
V11 6X4 Rectifier	1 2 3 4 5 6 7	250 a.c. 0 0 0 0 250 a.c. 0	200 INF INF INF INF 200 70K	
V12 OA2/VR150 Regulator	1 2 3 4 5 6 7	+150 0 0 0 +150 0 0	70K INF 0 0 70K INF 0	Tube in socket
J2 RF Socket	1 2 3 4 5	0 +150 0 6.3 a.c. +150	INF 70K INF 0 70K	Plug Out CAL. Contol clock-wise ADJ Controls clock-wise
P2 RF Plug	1 2 3 4 5	0 0 0 0 0	3.5 INF INF 1.5 INF	Disconnected
J4 Recorder Jack	ALL	+140	90K	

APPENDIX I

STORAGE AND SHIPMENT

1. STORAGE

a. Remove dust from controls and outer surface of instrument with a clean rag.

b. Wrap instrument in heavy wrapping paper and seal seams with gummed tape or similar adhesive.

c. Store in a dry place. If excessive humidity is unavoidable, place the instrument in a moisture-proof bag with a sufficient quantity of drying agent, such as silica gel, to insure a dry atmosphere.

d. When the use of bag and desiccant is necessary, check the instrument at 6-month intervals to determine the effectiveness of the seal.

2. SHIPMENT

a. Wrap the instrument with heavy wrapping paper and seal seams with gummed tape or similar adhesive.

b. Place in fibre-board carton or wooden box large enough to permit at least 3 inches of excelsior or similar packing material between the instrument and sides of the box.

c. For export packing, wrap the instrument in waterproof paper and seal the seams with glue or similar sealing compound before placing it in a wooden box.

APPENDIX II.

TABLE OF REPLACEABLE PARTS

MODEL 58-AS

SYMBOL	DESCRIPTION	FUNCTION
C1A, C1B, C1C, C1D, C1E	CAPACITOR: variable; 1.5 - 15 mmf; 13/16" x 5/8" x 1/2"; 2 solder terminals; screw driver adjust. Measurements Corp. Dwg. H-2774-2	Trimmer in antenna tank circuit for A, B, C, D & E Bands respectively.
C2A, C2B, C2C, C2D, C2E	CAPACITOR: variable. - Same as C1.	Trimmer in converter tank circuit for A, B, C, D & E Bands respectively.
C3A, C3B, C3C, C3D, C3E	CAPACITOR: variable. - same as C1.	Trimmer in oscillator tank circuit for A, B, C, D & E Bands respectively.
C4A	CAPACITOR: fixed; silvered mica; 93 mmf., ±2%; 45/64" x 29/64" x 3/16"; molded plastic; wax impregnated; 2 axial wire leads. Measurements Corp. Dwg. H-5524.	Padder in A Band oscillator tank circuit.
C4B	CAPACITOR: fixed; silvered mica; 145 mmf., ±2%; 1-1/16" x 7/16" x 3/16"; molded plastic; wax impregnated; 2 axial wire leads. Measurements Corp. Dwg. H-5525.	Padder in B Band oscillator tank circuit.
C4C	CAPACITOR: fixed; silvered mica; 265 mmf., ±2%; 1-1/16" x 7/16" x 3/16"; molded plastic; wax impregnated; 2 axial wire leads. Measurements Corp. Dwg. H-5426.	Padder in C Band oscillator tank circuit.
C4D	CAPACITOR: fixed; mica; 260 mmf., ±5%; 19/32" x 3/8" x 1/8". Measurements Corp. Dwg. H-4046.	Padder in D Band oscillator tank circuit.
C5	CAPACITOR: variable; air dielectric; 3 sections, not separately replaceable.	Tunes antenna, converter & oscillator tank circuits to desired frequency on each band.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
C6	CAPACITOR: fixed; ceramic; 47 mmf., ±10%; 1000 WVDC: 1/2" dia. x 5/32" thk; 2 radial wire leads. Measurements Corp. Dwg. H-5561.	Couples grid of V3 to grid coil.
C7	CAPACITOR: fixed; ceramic; 5,000 mmf., min.; 500 WVDC; 9/16" dia. x 1/8 thk; two radial wire leads. Measurements Corp. Dwg. H-5064.	RF by-pass in plate circuit of V2.
C8	CAPACITOR: fixed; mica; 100 mmf., ±20%, 500V; 23/32" x 15/32" x 13/64" molded plastic; 2 axial wire leads. Measurements Corp. Dwg. H-5172.	RF by-pass in oscillator tank circuit.
C9	CAPACITOR: fixed; mica; 1500 mmf, +20% -10%; 300 WVDC; 21/32" dia. x 9/32" thk; metal case; rim, one connection; center eyelet, other connection; center hole mtg. for #4 screw; button type. Measurements Corp. Dwg. HQ-154.	RF by-pass for screen grid of V2.
C10	CAPACITOR: fixed - same as C9.	RF by-pass in filament
C11	CAPACITOR: fixed; mica; 300 mmf., ±20%; 300 WVDC; 1-1/4" x 7/8" x 3/8"; 2 solder terminal; 1 hole mtg. for #6 scr. Measurements Corp. Dwg. H-2318.	Part of filament RF filter network.
C12	CAPACITOR: fixed - same as C7.	By-pass at Pin 4 of RF plug.
C13	CAPACITOR: fixed - same as C11.	RF by-pass at Pin 4 of RF plug.
C14	CAPACITOR: fixed - same as C-6.	Blocks D.C. plate voltage of V1 from grid of V2.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
C15	CAPACITOR: fixed - same as C7.	By-pass at pin 5 of RF Plug.
C16	CAPACITOR: fixed - same as C11.	RF by-pass at pin 5 of RF Plug.
C17	CAPACITOR: fixed - same as C11.	RF by-pass at pin 2 of RF Plug.
C18	CAPACITOR: fixed - same as C9.	RF by-pass for screen grid of V1.
C19	CAPACITOR: fixed - same as C9.	RF by-pass for filament of V1.
C20	CAPACITOR: fixed - same as C7.	By-pass at pin 2 of RF Plug.
C21	CAPACITOR: fixed - same as C11.	RF by-pass at pin 1 of RF Plug.
C22	CAPACITOR: fixed - same as C11.	RF by-pass at pin 3 of RF Plug.
C23	CAPACITOR: fixed - same as C6.	Couples antenna tank circuit to grid of V1.
C24	CAPACITOR: fixed - same as C7.	By-pass at pin 3 of RF Plug.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
C25	CAPACITOR: fixed; ceramic; 1K mmf., G.M.V.; 1000 WVDC; .290 dia. x 3/32 thk; 2 radial wire leads. Measurements Corp. Dwg. H-5500.	RF by-pass in filament of V4.
C26	CAPACITOR: fixed; mica; 82 mmf., ±10%; 7/16" x 3/8" x 1/8". Measurements Corp. Dwg. H-5528	RF by-pass for antenna tank circuit.
* C27	CAPACITOR: fixed; ceramic; 20 mmf., ±5%; 1/4 dia. x 15/32; 2 radial wire leads. Measurements Corp. Dwg. H-5529.	Tunes secondary T2.
* C28	CAPACITOR: fixed - same as C27.	Tunes primary of T3.
* C29	CAPACITOR: fixed - same as C27.	Tunes secondary of T3.
* C30	CAPACITOR: fixed - same as C27.	Tunes primary of T4.
* C31	CAPACITOR: fixed - same as C27.	Tunes secondary of T4.
* C32	CAPACITOR: fixed - same as C27.	Tunes primary of T5.
C33	CAPACITOR: fixed; ceramic; 10K mmf., G.M.V.; 600 WVDC; 5/8 dia. x 5/32 thk; 2 radial wire leads. Measurements Corp. Dwg. H-5356.	Couples V8, Dector Audio & Video output to V9.
C34	CAPACITOR: fixed; ceramic; feed-thru; 22 mmf. ±10%, 500 WVDC. Measurements Corp. Dwg. H-5587.	Determines the Det. time Constant for AVG position.

* - Not recommended for field replacement.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
C35	CAPACITOR: fixed; paper; .1 mfd., ±20%; 200 WVDC; 1/2 dia. x 1-1/2 lg.; 2 axial wire leads, molded plastic. Measurements Corp. Dwg. H-5072.	Determines the Det. time Constant for "Quasi-Peak" position.
C36	CAPACITOR: fixed; same as C25.	RF By-Pass in filament of V5.
C37	CAPACITOR: fixed; same as C25.	RF By-Pass in filament of V6.
C38	CAPACITOR: fixed; same as C25.	RF By-Pass in filament of V7.
C39	CAPACITOR: fixed; mica; 1500 mmf. +20% -10%; 7/8" dia. x 11/32 thk; metal case; Rim, one connection; center eyelet, other connection; button type. Measurements Corp. Dwg. H-1173.	Part of filter assy. in plate circuit of V7.
C40	CAPACITOR: fixed - same as C25.	RF By-Pass in filament of V8.
C41	CAPACITOR: fixed - same as C9.	RF By-Pass for Grid of V5.
C42	CAPACITOR: fixed - same as C9.	RF By-Pass for Cathode of V5.
C43	CAPACITOR: fixed - same as C9.	RF By-Pass for filament of V5.
C44	CAPACITOR: fixed - same as C9.	RF By-Pass for screen grid of V5.
C45	CAPACITOR: fixed - same as C9.	RF By-Pass for plate of V5.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
C46	CAPACITOR: fixed - same as C9.	RF By-Pass for Grid circuit of V6.
C47	CAPACITOR: fixed - same as C9.	RF By-Pass for cathode of V6.
C48	CAPACITOR: fixed - same as C9.	RF By-Pass for filament of V6.
C49	CAPACITOR: fixed - same as C9.	RF By-Pass for screen grid of V6.
C50	CAPACITOR: fixed - same as C9.	RF By-Pass for plate circuit of V6.
C51	CAPACITOR: fixed - same as C9.	RF By-Pass for cathode of V7.
C52	CAPACITOR: fixed - same as C9.	RF By-Pass for filament of V7.
C53	CAPACITOR: fixed - same as C9.	RF By-Pass for screen grid of V7.
C54	CAPACITOR: fixed - same as C39.	Part of filter assembly in plate circuit of V7.
C55	CAPACITOR: fixed - same as C9.	RF By-Pass for filament of V8.
C56	CAPACITOR: fixed - same as C33.	RF By-Pass for screen of V5.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
C57	CAPACITOR: fixed - same as C33.	RF by-pass for plate of V5.
C58	CAPACITOR: fixed - same as C33.	RF by-pass for grid circuit of V6.
C59	CAPACITOR: fixed - same as C33.	RF by-pass for cathode of V6.
C60	CAPACITOR: fixed - same as C33.	RF by-pass for screen of V6.
C61	CAPACITOR: fixed - same as C33.	RF by-pass for plate of V6.
C62	CAPACITOR: fixed - same as C33.	RF by-pass for 150V Buss.
C63	CAPACITOR: fixed - same as C33.	RF by-pass for grid circuit of V5.
C64	CAPACITOR: fixed - same as C33.	RF by-pass for cathode of V5.
C65	CAPACITOR: fixed; paper; .05 mfd.; 400 WVDC; 7/16" dia. 1-1/4" lg. 2 axial wire leads; molded plastic. Measurements Corp. Dwg. H-5516.	Couples audio & video output from V9 to phone jack.
C66	CAPACITOR: fixed - same as C6.	RF by-pass for audio & video output circuit.
C67	CAPACITOR: fixed - same as C33.	RF by-pass for 225V Buss.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
C68	CAPACITOR: fixed; ceramic; feed-thru; 1000 mmf, ±20%; 500 WVDC; 5/16 hex. body with 1/4-28 thd, 7/32 lg. for mtg.; 1/4-28 nut & lockwasher; 2 axial wire leads; overall length 1-1/4". Measurements Corp. Dwg. H-5515.	RF By-Pass for cathode circuit of V7. (Meter zero switch circuit).
C69	CAPACITOR: fixed; dry electrolytic; 25 mfd; 25 WVDC; 9/16" dia. x 1-1/4" lg., metal case; 2 axial wire leads. Measurements Corp. H-5182.	AF By-Pass for cathode circuit of V9.
C70	CAPACITOR: fixed; ceramic; 5K mmf., min.; 500 WVDC; 9/16" dia. x 1/8 thk; two radial wire leads. Measurements Corp. Dwg. H-5064.	By-Pass at Pin 4 of RF socket.
C71	CAPACITOR: fixed - same as C33.	RF By-Pass for AGC Buss.
C72	CAPACITOR: fixed - same as C35.	Integrating capacitor for AVC Buss.
C73	CAPACITOR: fixed - same as C9.	By-Passes positive terminal of microvolt meter.
C74	CAPACITOR: fixed - same as C9.	By-passes negative terminal of microvolt meter.
C75	CAPACITOR: fixed - same as C8.	RF By-Pass for noise diode B+ Buss.
C76	CAPACITOR: fixed - same as C25.	RF By-Pass for Ext. Meter Jack.
C77	CAPACITOR: fixed - same as C25.	RF By-Pass for Ext. Meter Jack.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
C78	CAPACITOR: fixed - same as C68.	RF By-Pass for filament leads.
C79	CAPACITOR: fixed - same as C68.	RF By-Pass for A.C. leads to switch.
C80	CAPACITOR: fixed - same as C68.	RF By-Pass for A.C. leads to switch.
C81 & C82	CAPACITOR: fixed; electrolytic; 2 sec.; 20-20 mfd.; 450 WVDC; 1" dia. x 5" lg; metal case, hermetically sealed; 2 solder term. for positive connections; common negative connection to shell; mounts on metal plate which has 2 holes 9/64" dia. on 1-1/2" centers. Measurements Corp. Dwg. H. 5130.	Power Supply filter capacitors.
C83	CAPACITOR: fixed; electrolytic; 20 mfd., 250 WVDC; 13/16" dia. x 1-3/4" lg; metal case, hermetically sealed with insulating sleeve; 2 axial wire leads. Measurements Corp. Dwg. H-5004.	Input filter capacitor for negative supply.
C84	CAPACITOR: fixed - same as C69.	Output filter capacitor for negative supply.
C85	CAPACITOR: fixed; ceramic; stand-off; 1000 mmf, ±20%; 500 WVDC; 5/16" hex. body with 1/4-28 thd, 3/8" lg., for mtg. & gnd. term; one solder term. overall length 1-1/64". Measurements Corp. Dwg. H-5531.	RF filter capacitors for A.C. line input.
C86	CAPACITOR: fixed - same as C85.	RF filter capacitors for A.C. line input.
C87	CAPACITOR: fixed - same as C85.	RF filter capacitors for A.C. line input.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
C88	CAPACITOR: fixed - same as C26.	RF by-pass for converter tank circuit.
C89	CAPACITOR: fixed - same as C70.	RF by-pass on pin 2 of RF socket.
C90	CAPACITOR: fixed - same as C68.	RF feed-thru by-pass for Log-Lin switch.
C91	CAPACITOR: fixed - same as C68.	RF feed-thru by-pass for Log-Lin switch.
C92	CAPACITOR: fixed - same as C25.	RF by-pass for meter circuit.
C93	CAPACITOR: fixed - same as C33.	RF by-pass for peak control.
C94	CAPACITOR: fixed - same as C25.	RF by-pass for filament of V4.
C95	CAPACITOR: fixed - same as C25.	RF by-pass for meter plate circuit.
C96	CAPACITOR: fixed - same as C25.	RF by-pass for osc. plate circuit.
C97	CAPACITOR: feed-thru, ceramic, same as C68.	RF by-pass for 150V Buss
C98	CAPACITOR: fixed; ceramic; 1000 mmf; 500 WVDC; 1/4" hex. x 1/2" lg; mounts by 6-32 x 5/16" lg. stud; 1 solder lug terminal. Measurements Corp. Dwg. H-5562.	RF by-pass for cathode of V2.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
C99	CAPACITOR: fixed; same as C98.	RF by-pass for cathode of V1.
C100, 1	CAPACITOR: fixed; same as C68.	Line filter by-pass.
C102, 3	CAPACITOR: fixed; same as C7.	Line filter by-pass.
C104	CAPACITOR: fixed; same as C33.	RF by-pass.
C106	CAPACITOR: fixed; same as C33.	Screen by-pass.
CR1	RECTIFIER: selenium half wave; 208 V.A.C., input; 160 V.D.C. output, 20 ma., 3/8" x 1/4" x 3/16" thk; 2 parallel wire leads. Measurements Corp. Dwg. H-5532.	Rectifier for negative voltage supply.
C105	CAPACITOR: fixed; same as C27.	
E1	LAMP: incandescent; 6-8 volts; 1/4 amp.; bulb T 3-1/4 clear; 1-1/8 O/A; miniature bayonet base; burn any position. Measurements Corp. Dwg. H-5016.	Pilot lamp indicates power on.
F1	FUSE: 0.8 amp; slow acting; rated continuous for 110% load; opens in one hour at 135% load; opens in 25 seconds at 200% load; 250 V; one time; glass body; metal ferrules; 1-1/4 lg. x 1/4" dia. Measurements Corp. Dwg. H-5018 Pt. 8.	Power line fuse.
F2	FUSE: - same as F1.	
J1	CONNECTOR: female contact; part of W1 cable assembly. Not separately replaceable.	IF Attn. input Jack.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
J2	CONNECTOR: receptacle; 6 female contacts; phenolic resin with retainer ring; 3/4" dia. x 13/16" lg.; mounts in 5/8" dia. hole. Measurements Corp. Dwg. H-5533.	RF power socket.
J3	JACK: telephone; open circuit; takes .250 dia. plug; mounts in single 3/8 dia. hole. Measurements Corp. Dwg. H-5534.	Jack for audio & video phones or oscilloscope.
J4	JACK: telephone; break contact on tip; takes .203 dia. plug; mounts in single 3/8" dia. hole. Measurements Corp. Dwg. H-5535.	Jack for external meter.
J5	CONNECTOR: receptacle; 3 female contacts, polarized; 13/16-27 thk. x 1-1/16" lg. overall; 1-knurled nut; 1 hex. nut; 1 lockwasher. Measurements Corp. Dwg. H-5536.	Antenna - or pickup connector.
J6	CONNECTOR: receptacle; 2 female contacts; not polarized; 9/16" w. x 1-9/16" lg. x 7/8" h. overall; mounts by 2-9/64 dia. holes on 1-1/8 centers. Measurements Corp. Dwg. H-5563.	Power supply a.c. connector.
L1A	COIL, R.F.: "A" Band; 7/16 O.D. x 1-7/16" lg; 4 solder lugs; yank, 11-7/8 turns #24 wire; link, 1-1/8 turns #24 wire. Measurements Corp. Dwg. H-376-1.	"A" band antenna tank inductance & coupling link.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
L1B	COIL, R.F.: "B" Band; 7/16 O.D. x 1-7/16" lg; 4 solder lugs; tank, 6-3/4 turns #24 wire; link 1-1/8 turns #24 wire. Measurements Corp. Dwg. H-377-1.	"B" Band antenna tank inductance & coupling link.
L1C	COIL, R.F.: "C" Band; 7/16" O.D. x 1-7/16" lg; 4 solder lugs; tank, 3-1/8 turns #24 wire; link 1-1/8 turns #24 wire. Measurements Corp. Dwg. H-378-1.	"C" Band antenna tank inductance & coupling link.
L1D	COIL, R.F.: "D" Band; consists of 2 coils; tank, 3-1/2 turns #16 wire; Measurements Corp. Dwg. H-379-1; Link, 2 turns #24 wire; Measurements Corp. Dwg. H-379-2.	"D" Band antenna tank inductance & coupling link.
L1E	COIL, R.F.: "E" Band; consists of 2 coils; tank, 1-1/2 turns #16 wire; Measurements Corp. Dwg. H-380-1; Link, 2 turns #24 wire; Measurements Corp. Dwg. H-380-2.	"E" Band antenna tank inductance & coupling.
L2A	COIL, R.F.: "A" Band; 7/16 O.D. x 1-11/16" lg; 4 solder lugs; tank, 12-1/4 turns #24 wire; Link, 2-1/8 turns #24 wire. Measurements Corp. Dwg. H-376-2.	"A" Band converter tank inductance & coupling link.
L2B	COIL, R.F.: "B" Band; 7/16 O.D. x 1-11/16" lg; 4 solder lugs; tank, 6-7/8 turns #24; Link, 2-1/8 turns #24 wire. Measurements Corp. H-377-2.	"B" Band converter tank inductance & coupling link.
L2C	COIL, R.F.: "C" Band; 7/16 O.D. x 1-11/16" lg; 4 solder lugs; tank 3-3/8 turns #24 wire. Measurements Corp. Dwg. H-378-2.	"C" Band converter tank inductance & coupling link.
L2D	COIL, R.F.: "D" Band; consists of 2 coils; tank, 3-1/2 turns #16 wire, both leads 3-7/8" lg; Measurements Corp. Dwg. H-379-1; Link, 3-1/2 turns #16 wire; one lead 1-3/8" lg, other lead 1-1/8" lg. Measurements Corp. Dwg. H-379-3.	"D" Band converter tank inductance & coupling link.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
L2E	COIL, R.F.: "E" Band; consists of 2 coils; tank, 1-1/2 turns #16 wire; Measurements Corp. Dwg. H-380-3; Link, 2 turns #24 wire; Measurements Corp. Dwg. H-380-4.	"E" Band converter tank inductance & coupling link.
L3A	COIL, R.F.: "A" Band; 7/16 O.D. x 1-11/16" lg; 4 solder lugs; one wire leads; tank, 8-3/4 turns #24 wire; Grid 3-7/8 turns #24 wire; Link, 2 turns #24 wire. Measurements Corp. Dwg. H-376-3.	"A" Band oscillator tank inductance, coupling link & grid coil.
L3B	COIL, R.F.: "B" Band; 7/16 O.D. x 1-11/16" lg; 4 solder lugs; one wire lead; tank, 5-3/4 turns #24 wire; Grid 2-1/2 turns #24 wire; Link 2 turns #24 wire. Measurements Corp. Dwg. H-377-3.	"B" Band oscillator tank inductance, coupling link & grid coil.
L3C	COIL, R.F.: "C" Band; 7/16 O.D. x 1-11/16" lg; 4 solder lugs; one wire lead; tank, 2-7/8 turns #24 wire; grid, 1-3/4 turns #24 wire; Link, 1 turn #24 wire. Measurements Corp. Dwg. H-378-3.	"C" Band oscillator tank inductance, coupling link & grid coil.
L3D	COIL, R.F.: "D" Band; consists of 3 coils; tank, 3 turns #16 wire; Measurements Corp. Dwg. H-379-4; Grid, 3 turns #24 wire; Measurements Corp. Dwg. H-379-5; Link, 1 turn #24 wire; Measurements Corp. Dwg. H-379-6.	"D" Band oscillator tank inductance, coupling link & grid coil.
L3E	COIL, R.F.: "E" Band; consists of 3 coils; tank, 2-1/2 turns #16 wire; Measurements Corp. Dwg. H-380-5; Grid, 2 turns #24 wire; Measurements Corp. Dwg. H-380-6; Link, 1 turn #24 wire; Measurements Corp. Dwg. H-380-7.	"E" Bank oscillator tank inductance, coupling link & grid coil.
L4A	COIL, R.F.: 1/4" dia. x 5/8" lg; 42 turns #40 wire; 2 radial wire leads. Measurements Corp. Dwg. H-4757.	Provides low resistance D.C. path across Padder Capacitor, C4-A.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
L4B	COIL, R.F.: 9/64" dia. x 3/8" lg; 37 turns,#40 wire; 2 axial wire leads. Measurements Corp. Dwg. H-4758.	Provides D.C. path across Capacitor C4B.
L4C	COIL, R.F.: - same as L4B.	Provides D.C. path across Capacitor C4C.
L4D	COIL, R.F.: - same as L4B.	Provides D.C. path across Capacitor C4D.
L5	CHOKE, R.F.: 15 microhenries, +5%; D.C. resistance 0.12 ohms; 7/32" dia. x 7/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-5538.	Filter unit in filament supply of V3, V2 & V1.
L6	CHOKE: 1.1 microhenry; 5/32" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-5537.	RF filter in filament of V5.
L7	CHOKE: - same as L6.	RF filter in filament of V6.
L8	CHOKE: - same as L6.	RF filter in filament of V7.
L9	CHOKE: - same as L6.	RF filter filament of V8.
L10	CHOKE, R.F.: - same as L5.	RF filter in filament of V5.
L11	CHOKE, R.F.: - same as L5.	RF filter in filament circuit between V6 & V7.
L12	CHOKE, R.F.: - same as L5.	RF filter in filament circuit between V7 & V8.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
L13	CHOKE: 10 hy. at 65 ma. D.C.; D.C. resistance 400 ohms; 1-5/8" w. x 3-3/8" lg. x 2" h; 2-3/16" dia. holes on 2-13/16" mounting center; 2 wire leads. Measurements Corp. Dwg. H-2705.	Power supply filter choke.
L14	CHOKE: 3 microhenries; 5/32" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-5539.	RF filters for A.C. input line.
L15	CHOKE: - same as L14.	RF filters for A.C. input line.
L16	CHOKE, R.F.: - same as L5.	RF filter in filament of V4.
L17	CHOKE, R.F.: 250 microhenries.	RF filter to V9.
L18	CHOKE: - same as L5.	Line filter.
L19	CHOKE: - same as L5.	Line filter.
# M1	METER: ammeter; D.C. type; 0-1 milliampere; rect. bakelite case; panel mtg. type; barrel 2-3/4" dia. x 29/32" deep behind panel face; rect. flange 4-5/8" w. x 4-3/16" lg. x 43/64" deep; full scale accuracy within ±2% of full scale value; D'Arsonval movement; calibrated for non-magnetic panel; scale "microvolts" & D.B.", Black, Red & Green numerals on white background; red pointer; 4 - #6 mounting studs at 4" lg. horiz. x 3-9/16" vert. centers; 2 stud terminals 1/2" lg. max. spaced 1-1/2". Measurements Corp. Dwg. H-943.	Microvolt Indicator.
P1	CONNECTOR: male contact; part of W2 cable assembly; not separately replaceable.	IF Attenuator input plug.
P2	CONNECTOR: plug; 6 male contacts; phenolic resin; 11/16" dia. x 13/16" lg. Measurements Corp. Dwg. H-5540.	RF Power Plug.
P3	CONNECTOR: plug; 3 male contacts; part of W8 cable assembly, not separately replaceable.	Plugs on antenna cable H-112.
*L20	CHOKE: 14 uv, ± 10%. Meas. Corp. Dwg. H-5597.	

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
P4	CONNECTOR: plug - same as P3.	Plugs on antenna cable, H-112.
P5	CONNECTOR: receptacle; 3 female contacts; polarized 13/16" dia. O.D. x 1-1/4" lg. Measurements Corp. Dwg. H-5541.	Receptacle on loop, H-110.
P6	Not used.	
P7	Not used.	
P8	CONNECTOR: Part of W7.	Terminates one end of power cable W7.
P9	CONNECTOR: plug; 2 male contacts; not polarized; 1-3/8" dia. x 1" lg. Measurements Corp. H-5564.	Connects a.c. power from line filter to chassis.
P10	ADAPTER: telephone plug to tip jack. Meas. Corp. H-5598.	
R1	RESISTOR: fixed; composition; 100 ohms, ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3728-101.	Isolating resistor in plate of V3.
R2	RESISTOR: fixed; composition; 15,000 ohms, ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3728-153.	V3 grid return.
R3	RESISTOR: fixed; composition; 330 ohms, ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3728-331.	Isolating resistor in plate circuit of V2.
R4	RESISTOR: fixed; same as R1.	Isolating resistor in plate circuit of V3.
R5	RESISTOR: fixed; same as R3.	Isolating resistor in plate circuit of V1.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
R6	RESISTOR: fixed; composition; 15,000 ohms, ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3728-153.	Dropping resistor for screen grid of V2.
R7	RESISTOR: fixed; same as R3.	Part of RF filter in plate circuits.
R8	RESISTOR: fixed; composition; 220,000 ohms, ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3728-224.	V2 grid return.
R9	RESISTOR: fixed; same as R3.	Part of RF filter in screen grid circuit of V1.
R10	RESISTOR: fixed; same as R3.	Part of RF filter in screen grid circuit of V1.
R11	RESISTOR: fixed; same as R8.	RF amplifier grid return.
R12	RESISTOR: fixed; wire wound; 1.3 ohms, ±10%; 1 watt; 1/4" dia. x 1-1/4" lg; 2 axial wire leads. Measurements Corp. Dwg. H-5542.	Part of RF filter in filament circuit of V4
R13	RESISTOR: fixed; same as R3.	Part of RF filter in antenna section of tank circuit.
R14	RESISTOR: fixed; composition; 15,000 ohms, ±10% 1 watt; 15/64" dia. x 9/16" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3731-153.	Antenna section dropping resistor.
R15	Not used.	

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
R16	RESISTOR: fixed; composition; 390 ohms, ±5%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3727-391.	Part of IF Attenuator.
R17	RESISTOR: fixed; composition; 200 ohms, ±5%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3727-201.	Part of IF Attenuator.
R18	RESISTOR: fixed; same as R17.	Part of IF Attenuator.
* R19	RESISTOR: fixed; composition; 75,000 ohms, ±5%; 1/2 watt; 9/64" dia. x 5/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3727-753.	Damping resistor in primary circuit of T3.
* R20	RESISTOR: fixed; same as R19.	Damping resistor in secondary circuit of T3.
* R21	RESISTOR: fixed; same as R19.	Damping resistor in primary circuit of T4.
* R22	RESISTOR: fixed; same as R19.	Damping resistor in secondary circuit of T4.
R23	RESISTOR: fixed; same as R3.	Part of IF Filter in plate circuit of V7.
R24	RESISTOR: fixed; composition 2 megohms, ±5%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3727-205.	Part of V8 Det. load resistor.
R25	RESISTOR: fixed; composition; 5,100 ohms, ±5%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3727-512.	Dropping resistor in screen grid circuit of V5.

* - Not recommended for field replacement.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
R26	RESISTOR: fixed; same as R3.	Part of IF Filter in plate circuit of V5.
R27	RESISTOR: fixed; composition; 3,300 ohms, ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3728-332.	Part of IF Filter in grid circuit of V6.
R28	RESISTOR: fixed; same as R25.	Dropping resistor in screen grid circuit of V6.
R29	RESISTOR: fixed; same as R3.	Part of RF filter in plate circuit of V6.
R30	RESISTOR: fixed; same as R25.	Dropping resistor in screen grid circuit of V7.
R31	RESISTOR: fixed; same as R3.	Part of RF filter in plate circuit of V7.
R32	RESISTOR: variable; composition; 3 megohms; 2 watts; linear taper; 1/8 shaft extension from mounting bushing; screw driver adjust; 2 mounting nuts; no locating pin. Measurements Corp. Dwg. H-5543.	"Log" adjustment to obtain log scale part of V8 det. load on chassis.
R33	RESISTOR: fixed; composition; 1 megohm, ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3728-105.	Part of V8 Det. load.
R34	RESISTOR: variable; wire wound; 1,000 ohms; 2 watts; linear taper; 1/8 shaft extension from mounting bushing; screw driver adjust; 2 mounting nuts; no locating pin. Measurements Corp. Dwg. H-5544.	"Peak" zero adjustment on chassis.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
R35	RESISTOR: variable; composition; 10,000 ohms; 2 watts; linear taper; 5/8 shaft extension from mounting bushing; no locating pin. Measurements Corp. Dwg. H-5545.	"PEAK" control on pand. Controls bucking voltage to detector.
R36	RESISTOR: fixed; composition; 47,000 ohms, ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3728-473.	Detector load resistor, Peak position.
R37	RESISTOR: fixed; same as R36.	Detector load resistor, AVG position.
R38	RESISTOR: fixed; same as R27.	Part of IF Filter in grid circuit of V5.
R39	RESISTOR: fixed; composition; 220 ohms, ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3728-221.	Part of RF filter in cathode circuit of V5.
R40	RESISTOR: fixed; same as R39.	Part of RF filter in cathode circuit of V6.
R41	RESISTOR: variable; wire wound; 500 ohms; 2 watts; linear taper; 1/8 shaft extension from mounting bushing; screw driver adjust; 2 mounting nuts, no locating pin. Measurements Corp. Dwg. H-5546.	LOG Gain Adjust. on chassis.
R42	RESISTOR: variable; same as R41.	Linear Gain Adjust. on chassis.
R43	RESISTOR: fixed; same as R39.	Cathode bias resistor for V7.
R44	RESISTOR: fixed; composition; 22,000 ohms, ±10%; 2 watt; 5/16" dia. x 11/16" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3734-223.	Plate load resistor for V9.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
R45	RESISTOR: fixed; composition; 2 megohms, + 5%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3727-205.	Bleeder, resistor for C65.
R46	RESISTOR: fixed - same as R3.	Part of RF filter at Pin #5 of RF socket.
R47	RESISTOR: fixed; composition; 7,500 ohms, + 5%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3727-752.	Part of voltage divider in CAL. circuit.
R48	RESISTOR: variable; composition; 50,000 ohms, +20%; 2 watts; clockwise Log. taper; 3 solder lug terminals; 1/2 shaft extension from mounting bushing; 2 mtg. nuts. Measurements Corp. Dwg. H-5547.	Provides panel adjustment to control sensitivity of receiver (Cal).
R49	Not Used.	
R50	RESISTOR: variable - same as R34.	Q.P. gain adjustment on Chassis.
R51	RESISTOR: fixed - same as R44.	Plate load resistors for V10.
R52	RESISTOR: fixed - same as R44.	Plate load resistors for V10.
R53	RESISTOR: fixed - same as R33.	Grid return for V9.
R54	RESISTOR: fixed; composition; 1,500 ohms, +10%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3728-152.	Cathode bias resistor for V9.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
R55	RESISTOR: fixed; composition; 1,000 ohms, ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3728-102.	Part of cathode bias resistor of V10.
R56	RESISTOR: variable - same as R34.	Part of cathode bias of V10. Sets AVG position Zero on chassis.
R57	RESISTOR: variable; wire wound; 1,000 ohms, ±10%; linear taper; 1/2 shaft extension from mounting bushing; 2 mounting nuts, no locating pin. Measurements Corp. Dwg. H-5548.	Zero adjust on front panel, controls cathode current of V10A.
R58	RESISTOR: fixed; composition; 510 ohms, ±5%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3727-511.	Part of cathode bias circuit of V10A.
R59	RESISTOR: fixed - same as R17.	M1 - meter shunt.
R60	RESISTOR: fixed - same as R54.	Dummy resistor in meter circuit when external meter is not in use.
R61	RESISTOR: fixed; composition; 240 ohms, ±5%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3727-241.	Part of input attenuator.
R62	RESISTOR: fixed; composition; 330 ohms, ±5%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3727-331.	Part of input attenuator.
R63	RESISTOR: fixed - same as R62.	Part of input attenuator.
R64	RESISTOR: fixed; composition; 39 ohms, ±5%; 1/2 watt; 9/64" dia. x 3/16" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3727-390.	Part of input attenuator.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
R65	RESISTOR: fixed - same as R64.	Part of input attenuator.
R66	RESISTOR: fixed - same as R64.	Part of input attenuator.
R67	RESISTOR: fixed - same as R64.	Part of input attenuator.
R68	RESISTOR: fixed - same as R64.	Part of input attenuator.
R69	RESISTOR: fixed - same as R64.	Part of input attenuator.
R70	RESISTOR: fixed - same as R64.	Part of input attenuator.
R71	RESISTOR: fixed - same as R64.	Part of input attenuator.
R72	RESISTOR: fixed - same as R61.	Part of input attenuator.
R73	RESISTOR: fixed - same as R62.	Part of input attenuator.
R74	RESISTOR: fixed - same as R62.	Part of input attenuator.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
R75	RESISTOR: variable; wire wound; 75 ohms, ±10%; linear taper 1/2 shaft extension from mounting bushing; 2 mounting nuts; no locating pin. Measurements Corp. Dwg. H-5549.	Provides panel adjustment of V4, filament circuit (ADJ.).
R76	RESISTOR: fixed; wire wound; 1,000 ohms, ±10%; 10 watts; vitreous enamel; 1-3/4" lg. x 3/8" dia; 2 radial solder lug terminals. Measurements Corp. Dwg. H-5118.	Dropping resistor in power supply to V12.
R77	RESISTOR: fixed; composition; 36,000 ohms, ±5%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3727-363.	Part of filter circuit of negative supply.
R78	RESISTOR: fixed - same as R19.	Dropping resistor in negative supply.
R79	RESISTOR: fixed; composition; 47 ohms, ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3728-470.	Part of RF filter in 150V Buss in T1 circuit.
R80	RESISTOR: fixed; composition; 470 ohms, ±10%; 1/2 watt; 9/64" dia. x 3/8" lg; 2 axial wire leads. Measurements Corp. Dwg. H-3728-471.	Cathode bias for V2.
R81	RESISTOR: fixed - same as R39.	Cathode bias for V3.
R82	Not used.	
R83	RESISTOR: fixed - same as R8.	Damping resistors.
R84	RESISTOR: fixed - same as R19.	Damping resistors.
R86	RESISTOR: Adjustable; wire wound; 750 ohms; ±10%; 25 watts; 5/8" dia. x 2" lg. Measurements Corp. Dwg. H-5522.	Filter resistor.
R85	RESISTOR: fixed; same as R27.	Meter Multiplier.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
S1	SWITCH: pushbutton; 5 plungers, locking action; locks with latch bar; metal body; 4-3/8" lg. x 1-1/8" w. x 4-1/16" deep; 1-5/8" lg. plunger; 59 solder lugs; 2-9/64" dia. holes on 4-1/8" mtg. centers. Measurements Corp. Dwg. H-1188.	Antenna section of frequency range switch; push rods actuate S2 & S3.
S2	SWITCH: pushbutton; 5 plungers, locking action; locks with latch bar; metal body; 4-3/8" lg. x 1-1/8" w. x 2-15/16" deep; 1/2" lg. plunger; 29 solder lugs; 2-9/64" dia. holes on 4-1/8 mtg. centers. Measurements Corp. Dwg. H-196.	Converter section of frequency range switch; push rods actuate S1 & S3.
S3	SWITCH: pushbutton - same as S2.	Oscillator section of frequency range switch.
S4	SWITCH: rotary; single section; 4 pole, 2 position; shorting type; no adjustable stop; 1-1/4" dia. base; 3/8-32 bushing x 3/8 lg; 1/4 dia. shaft x 3/4 lg; 2-1/16 overall length; 1-3/8-32 nut & lockwasher. Measurements Corp. Dwg. H-5459.	IF attenuator switch.
S5	SWITCH: lever; single section; 2 pole, 3 position; non-shorting type; 1-7/8 x 7/16 base x 1-3/8 deep behind panel; 5/8 lg. lever; 2 - #6-32 holes on 1-5/8 mtg. centers. Measurements Corp. Dwg. H-5550.	Detector function switch
S6	SWITCH: toggle; D.P.D.T; 1 amp., 250 V; molded phenolic body; 1/2" x 1-1/8" x 3/4" deep behind panel; Bat handle; locking action; 6 solder lug terminals; single hole mtg.; bushing 15/32-32 x 15/32 lg. Measurements Corp. Dwg. H-5565.	Scale selector switch. Switches A.G.C. "ON" for "LOG", "OFF" for "LIN".
S7	SWITCH: toggle; S.P.S.T.; 1 amp., 250 V; molded phenolic body; 1/2 x 1-1/8 x 3/4 deep behind panel; Bat handle; momentary action; 2 solder lug terminals; single hole mounting; bushing 15/32-32 x 15/32 lg. Measurements Corp. Dwg. H-5551.	Meter zero switch. Opens cathode circuit of V7.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
S8	SWITCH: pushbutton; 8 plungers, locking action; locks with latch bar; metal body; 6-7/16 lg. x 1-7/16 w. x 3-7/8 deep; 42 solder lugs; 2-9/64 dia. holes on 6 mtg. centers; includes one AC D.P.S.T switch. Measurements Corp. Dwg. H-198.	Operation switch for selecting attenuator steps ZERO, CAL., ADJ. & OFF circuits.
* T1	TRANSFORMER: I.F.; single tuned; Fo = 12 Mc.; 1-13/32 lg. x 1-13/32 w. x 1-7/16 deep; mounts with 4 - #6-32 screws, 2 on 1" centers & 2 on 1-5/16 centers; includes connector J1 & cable assy. W1. Measurements Corp. Dwg. H-167.	1st IF transformer, V2. Converter plate load.
* T2	TRANSFORMER: I.F.; single tuned; Fo = 12 Mc.; 1-7/16 lg. x 1-7/16 w. x 3-13/16 lg; mounts with 2 - #6-32 lugs on 1-5/16 centers; includes cable assy. W3 & Capacitor C27. Measurements Corp. Dwg. H-1990.	2nd I.F. Transformer grid circuit of V5.
* T3	TRANSFORMER: I.F.; double tuned; Fo - 12 Mc.; 1-13/32 lg. x 1-13/32 w. x 3-13/16 deep; includes 2 capacitors & 2 resistors. Measurements Corp. Dwg. H-1989.	3rd I.F. Transformer plate load of V5 & grid circuit of V6.
* T4	TRANSFORMER: I.F. - same as T3.	4th I.F. Transformer plate load of V6 & grid circuit of V7.
* T5	TRANSFORMER: I.F.; single tuned; Fo = 12 Mc.; 1-13/32 lg. x 1-13/32 w. x 3-13/16 deep; includes Capacitor C32. Measurements Corp. Dwg. H-1991.	5th I.F. Transformer plate load of V7 and output to V8.
T6	TRANSFORMER: power; plate & filament type; input 117V, 50-60 cycles single phase; 3 output windings; sec. #1, 255-0-255 V.A.C. at 65 ma. D.C. load; 2 red leads & one red with yellow tracer lead; Sec. #2, 6.3V. at 2.9 amp.; 2 green leads; sec. #3, 6.3V. at 0.6 amp.; 2 brown leads; shell type metal case; 2-15/16 x 3-1/8 x 3-1/2 high; mount with four slots for #8 screws on 2 x 2-1/4 centers. Measurements Corp. Dwg. H-5447.	Power Transformer

* - Not recommended for field replacement.

TABLE OF REPLACEABLE PARTS

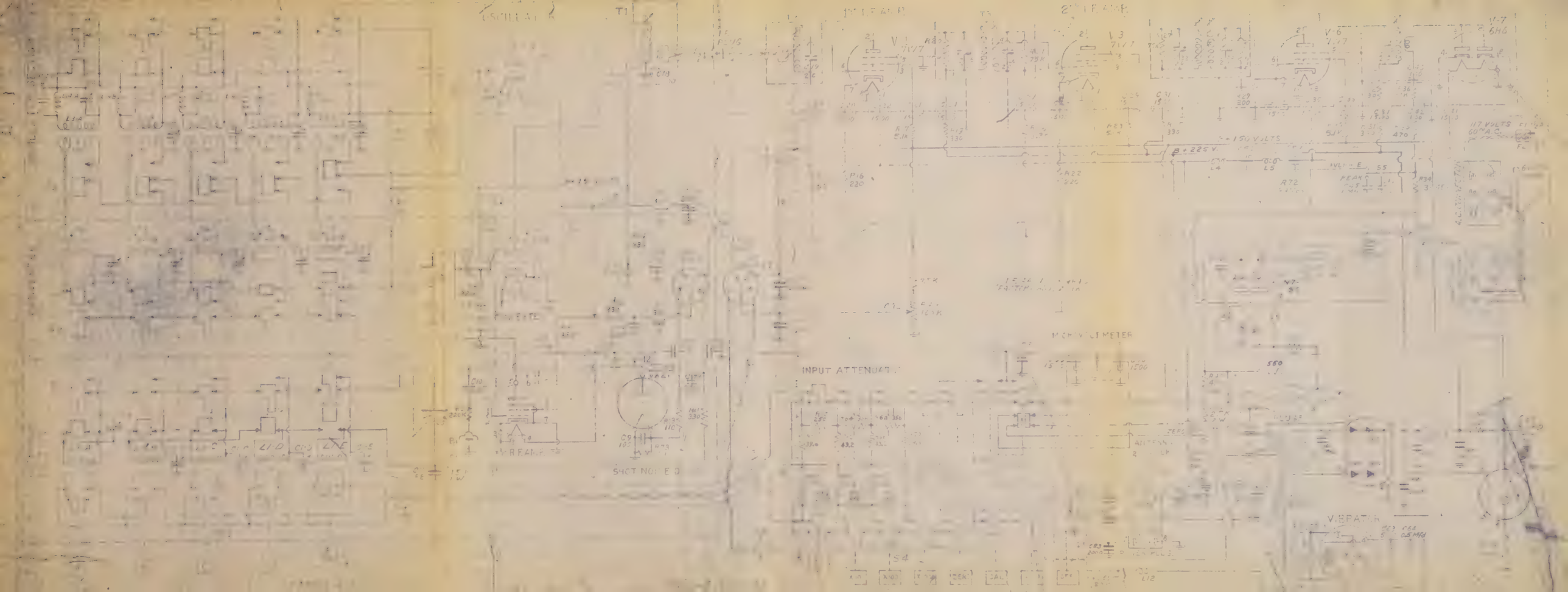
SYMBOL	DESCRIPTION	FUNCTION
V1	TUBE: Electron; RETMA #6AK5.	RF Amplifier.
V2	TUBE: Electron - same as V1.	Converter.
V3	TUBE: Electron; RETMA #955.	Local Oscillator.
V4	TUBE: Electron; 5845.	Noise Diode, Calibrator.
V5	TUBE: Electron; RETMA 6CF6.	1st I.F. Amplifier.
V6	TUBE: Electron - same as V5.	2nd I.F. Amplifier.
V7	TUBE: Electron - same as V5.	3rd I.F. Amplifier.
V8	TUBE: Electron; RETMA 6AL5.	Detector.
V9	TUBE: Electron; RETMA 6AK6.	Audio Amplifier.
V10	TUBE: Electron; RETMA 12AU7.	Meter Amplifier.
V11	TUBE: Electron; RETMA 6X4.	Rectifier.
V12	TUBE: Electron; RETMA 0A2.	Voltage reference tube.
W1	CABLE ASSY.: I.F. Transformer; co-axial, RG-108/U; 2 conductors shielded; one end terminated in female bayonet connector; other end, shield terminated in eyelets, and 2 conductors not terminated. Measurements Corp. Dwg. H-5435.	Connects 1st I.F. Transformer & J1 to I.F. Attenuator.

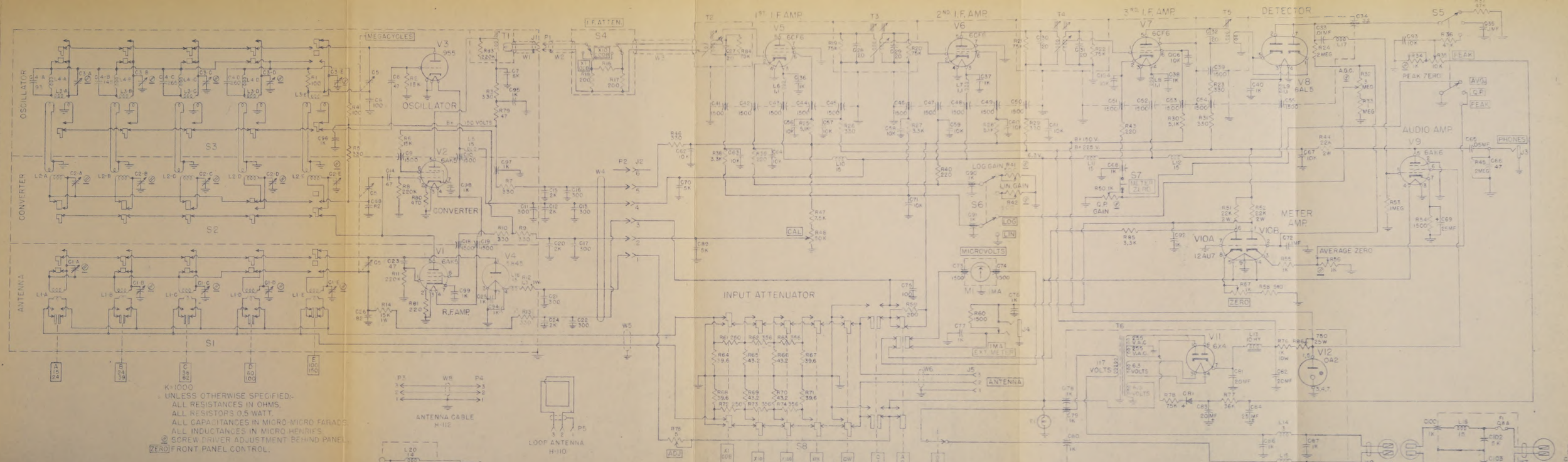
TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
W2	CABLE ASSY.: I.F. Attenuator; co-axial, RG-108/U; 2 conductors, shielded; one end terminated in male bayonet connector; other end, shield terminated in bushing, 2 conductors not terminated. Measurements Corp. Dwg. H-5434.	Connects I.F. Attenuator top to 1st I.F. Transformer.
W3	CABLE ASSY.: I.F. Transformer; co-axial, RG-108/U; 2 conductors; shielded; one end shield terminated in bushing, other end shield terminated in eyelet; 2 conductors not terminated either end. Measurements Corp. Dwg. H-5436.	Connects I.F. Attenuator to 2nd I.F. Transformer.
W4	CABLE ASSY.: R.F. input filter; 5 conductors; 1 - #22 str., white/yellow lead 9-1/2 lg; 1 - #22 str., white/blue lead 8-1/2 lg.; 1 - #22 str., white/green lead 7-1/2 lg.; 1 - #18 str. white lead 6 - 1/2 lg.; 1 - #22 str., white/read lead 5-1/2 lg.; ends not terminated. Measurements Corp. Dwg. H-5552.	R.F. input filter cable.
W5	CABLE ASSY.: R.F. unit input; co-axial, RG-108/U; 2 conductors, shielded; one end shield terminated in eyelet, other end shield terminated in solder lug; 2 conductors not terminated either end. Measurements Corp. Dwg. H-5448.	Connects RF Attenuator to antenna coil assy.
W6	CABLE ASSY.: antenna input; co-axial, RG-108/U; 2 conductors, shielded; one end terminated in connector; J5; other end shield terminated in solder lug, 2 conductors not terminated. Measurements Corp. Dwg. H-5446.	Connects antenna jack J5 to RF attenuator.
W7	CABLE: power; includes P8. Measurements Corp. Dwg. H-704.	Power cord.

TABLE OF REPLACEABLE PARTS

SYMBOL	DESCRIPTION	FUNCTION
W8	CABLE ASSY.: antenna; 2 conductors, shielded, covered with braid of black cotton; each end terminated in a 3 male contact connector, P3 & P4; 7/8 dia. x 14'-8-3/4" lg. Measurements Corp. Dwg. H-112.	Antenna cable.
W9	CORD: A.C. Line #18 AWG Type POSJ.	A.C. line cord from I.F. chassis to filter box.


OSCILLATOR
1ST I.F. AMP.
2ND I.F. AMP.
V-6
V-7
6H6
117 VOLTS
60 MC.
+150 VOLTS
B+225 V.
R72
PEAK
INPUT ATTENUATOR
METER
V. BEATER
SHOT NO. E 0

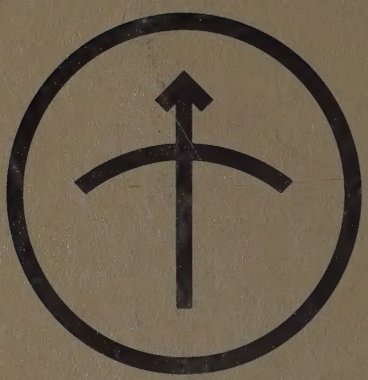


SCHEMATIC DIAGRAM
MODEL 58 AS

D-5461-N

MEASUREMENTS

BOX 180, BOONTON
NEW JERSEY



www.manualsplus.com
1002401